

- NOTES:
1. THE EXISTING SLUDGE COLLECTION SYSTEM (LEOPOLD CLARK-TRAC SYSTEM) WAS INSTALLED IN 1998. INFORMATION PROVIDED BY THE CITY OF LYNCHBURG.
  2. CUT AND REMOVE 4" LONG SECTION OF SLUDGE COLLECTION HEADER (TYP OF 2 PER BASIN) AND RECAP ENDS TO FORM A TIGHT SEAL. CUT IS REQUIRED FOR INSTALLATION OF TUBE SETTLER SUPPORT SYSTEM.
  3. REFERENCE SHEET S1.

**DEMOLITION DRAWING GENERAL NOTE:**

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1

BASE BID - REPAIR BASIN HANDRAIL. MOST BASIN RAIL HAS BECOME MISALIGNED AND INSECURELY ANCHORED DUE TO FREEZING OF WATER IN THE POSTS, CAUSING THE POSTS TO RISE OUT OF THEIR POST SLEEVES. REMOVE POSTS WITH RAIL INTACT. CLEAN OUT POST SLEEVES, PROVIDE A 1/4" DRAIN HOLE IN SIDE OF EACH POST 1/2" ABOVE SLAB. REINSTALL EXISTING RAIL AND POSTS, LEVEL AND PLUMB, AND REDROUT ALL POSTS.

2

BASE BID - REPAIR SURFACE SPALLING

3

BASE BID - FILL BASIN WALL AND WALKWAY CONTROL AND EXPANSION JOINTS.

4

BASE BID - PAINT 28 VALVE STANDS, 4 FLOCCULATOR DRIVES, 4 FLOCCULATOR DRIVE CONTROL PANELS, 4 RECEPTACLE BOXES AND TWO FEET OF EXPOSED CONDUIT AT EACH. FOUR 3" DIAMETER MANWAY COVERS AND FRAMES IN SLABS, ONE 4" X 2'-8" DOUBLE LEAF FLOOR DOOR AND FRAME (ALL ACCESSIBLE SURFACES), 18 FEET OF 3" CONDUIT FOR THREE LIGHT FIXTURES ON ROOF, FOUR STEEL LADDERS WITH ROO TREAD (3.3.10 AND 10' HEADJAMING 4" RETURNING ABOVE TOP SLABS, 28 FEET OF 2-RAIL WELDED STEEL HANDRAIL WITH 8 POSTS, ALARM BELL ON WALL OF CONTROL BUILDING ABOVE THE DOOR TO THE FILTERS AND TWO SHEAR GATES WITH HANDLES. REFER TO LEAD-IN PAINT SURVEY REPORT APPENDED TO SPECIFICATIONS.

SEALS

CONSULTANT

BID READY

ABERT FILTRATION PLANT  
FILTER REHABILITATION  
CITY OF LYNCHBURG, VIRGINIA

HSM

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WILEY & WILSON  
CONSULTING ENGINEERS  
LYNCHBURG, VA  
ROANOKE, VA

REVISIONS

67-342

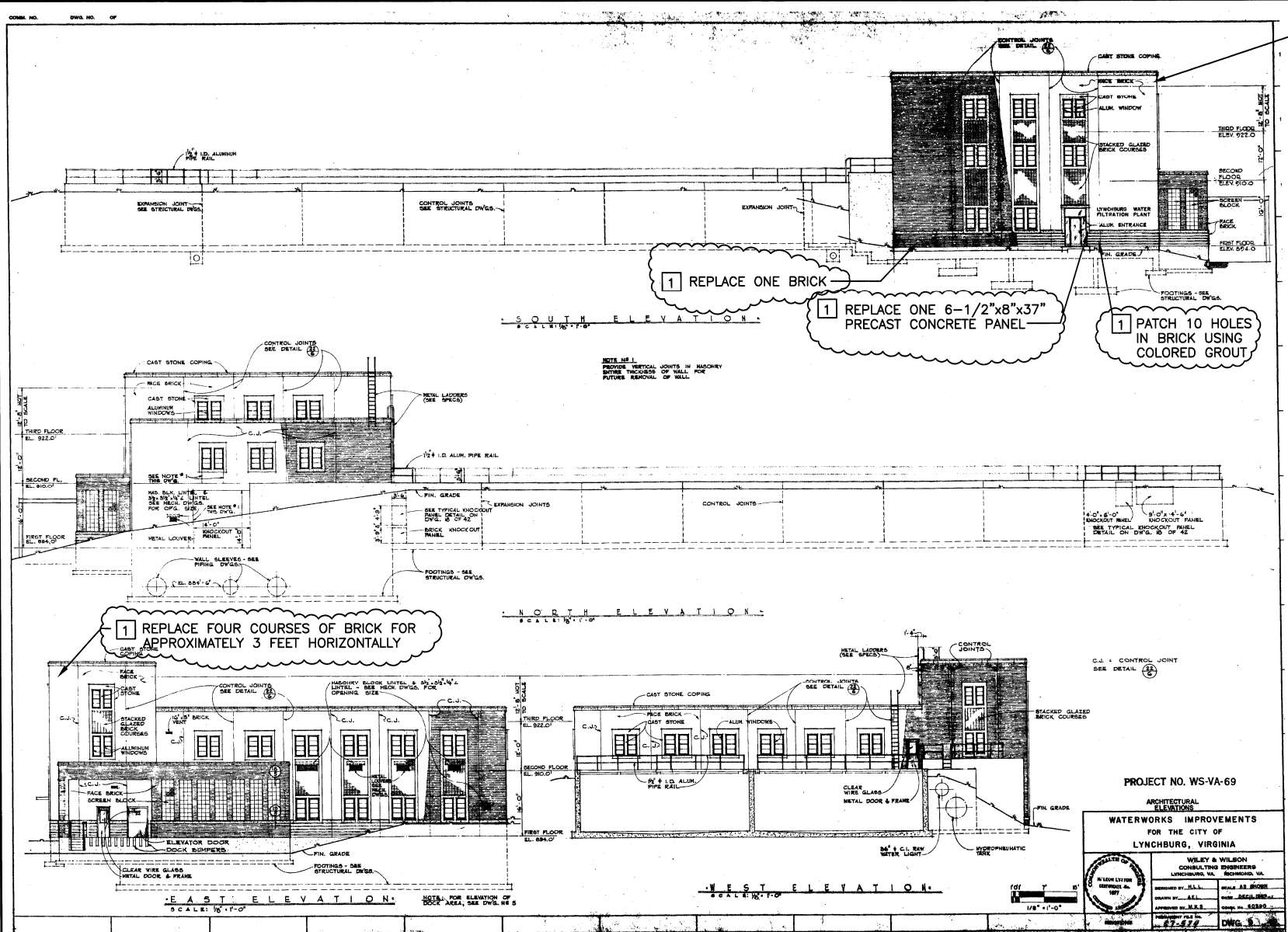
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DEMOLITION

BASIN HANDRAIL AND CONCRETE  
REPAIRS AND PAINTING

D1

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1 BASE BID - MASONRY REPAIRS

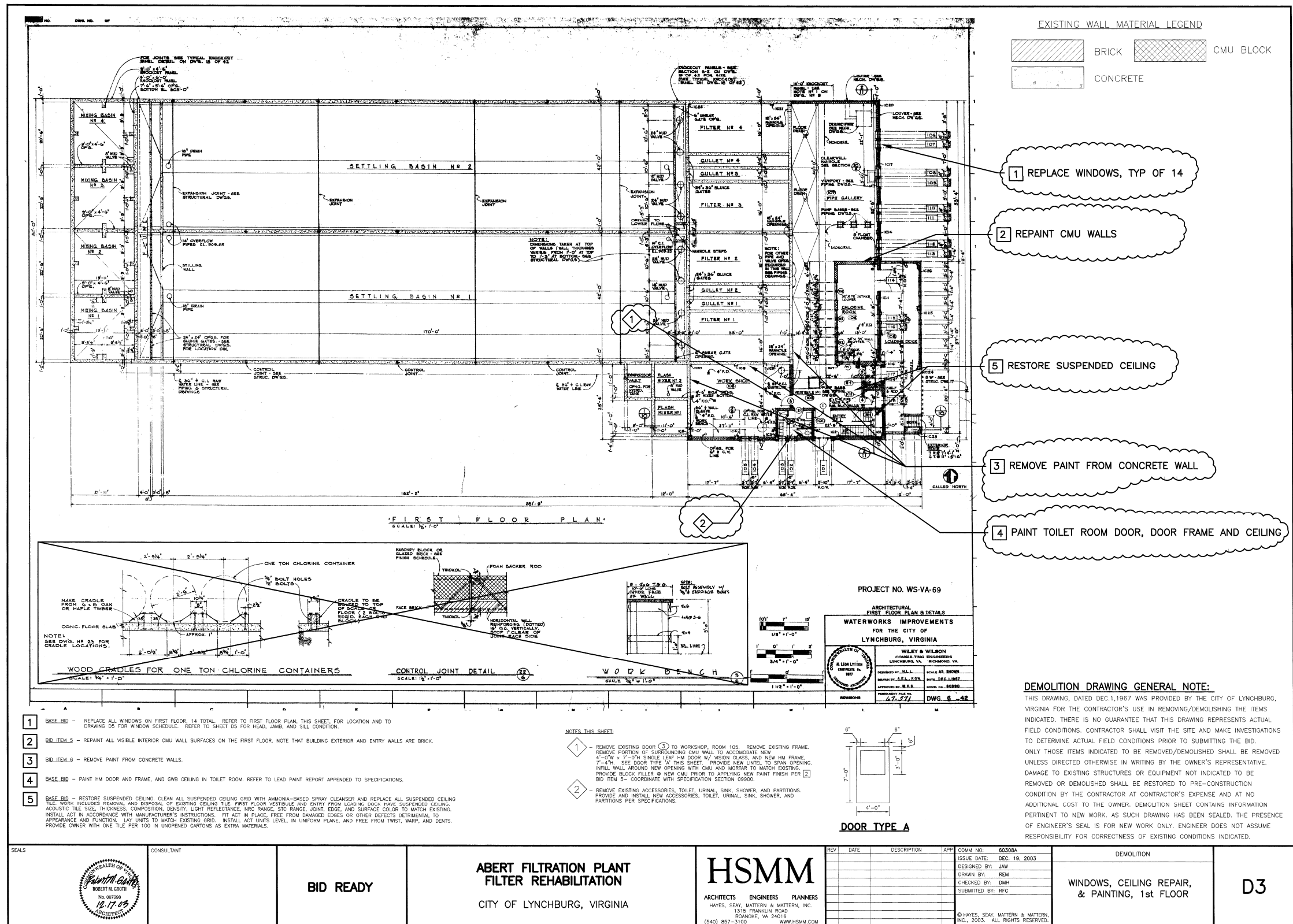
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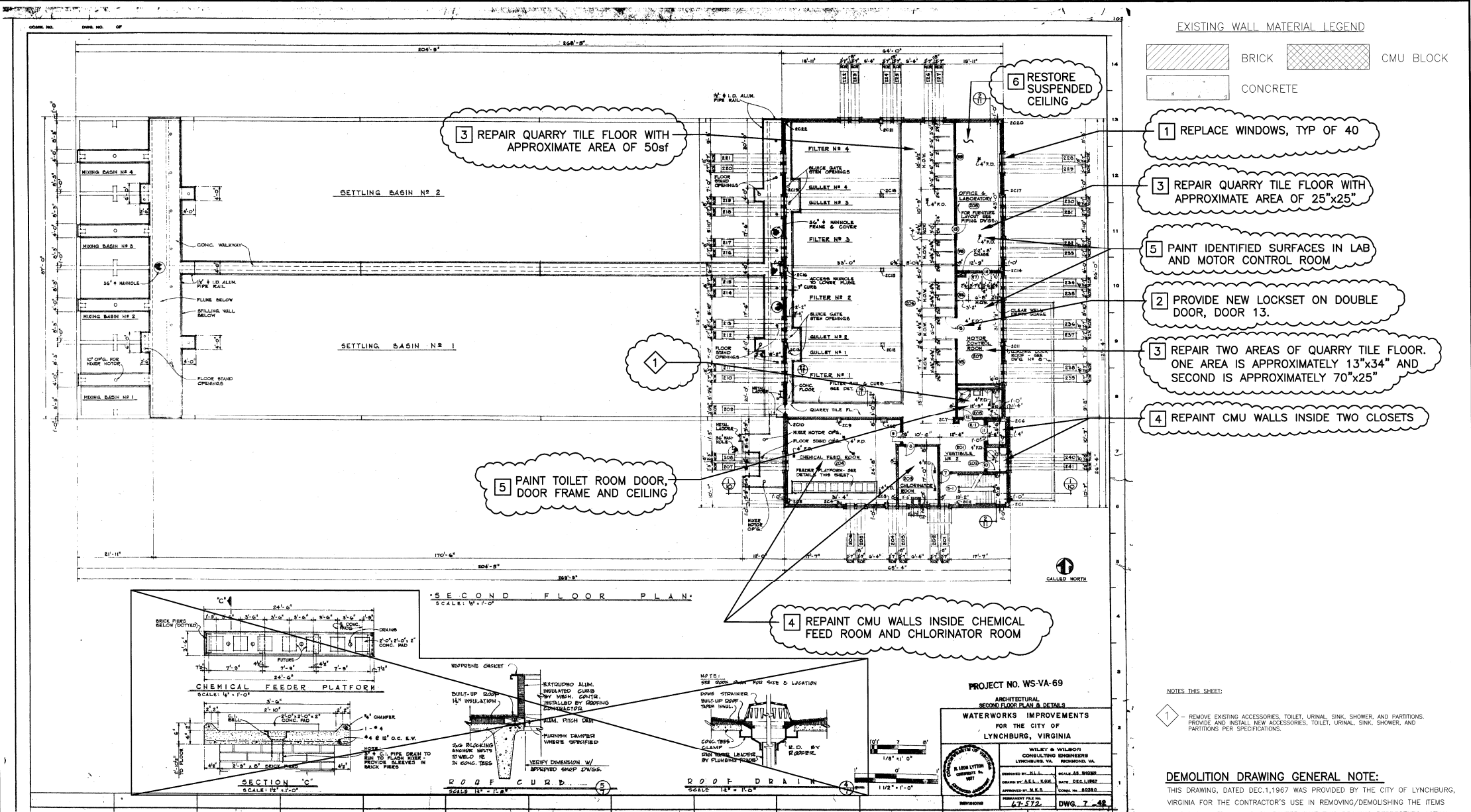
- FOR ALL MASONRY REPAIR/REPLACEMENT:  
DELIVER PRODUCTS TO SITE. STORE AND PROTECT AGAINST DAMPNENESS, FREEZING, AND FOREIGN MATTER. INSPECT UNITS FOR DAMAGE UPON DELIVERY. BRICKS TO BE OF SIZE, SHAPE, AND COLOR TO MATCH EXISTING. MORTAR TO MATCH EXISTING. WHERE NEW MASONRY JOINS OLD WORK IN CONTINUOUS LINE, CUT OLD WORK TO PROVIDE KEYS FOR NEW WORK TO BE TOOTHED IN. REMOVE LOOSE MASONRY AND MORTAR. LAY MASONRY UNITS IN FULL BED OF MORTAR, WITH FULL HEAD JOINTS, UNIFORMLY JOINED WITH OTHER WORK. REMOVE EXCESS MORTAR AS WORK PROGRESSES.
- FOR ARCHITECTURAL PRECAST CONCRETE WALL PANEL REPLACEMENT:  
DELIVER PRODUCTS TO SITE. STORE AND PROTECT UNITS TO PREVENT STAINING, CHIPPING, OR SPALLING OF CONCRETE. PRECAST WALL PANEL MEASURING: 6'-1/2" x 8'-0" x 37" TO BE REPLACED IN KIND, INCLUDING REINFORCEMENT AND INSULATION AS REQUIRED. COLOR, WORKMANSHIP, TEXTURE, AND GENERAL APPEARANCE TO MATCH EXISTING. CONTRACTOR TO VERIFY DIMENSIONS IN FIELD PRIOR TO FABRICATION. FABRICATOR TO INDICATE TO CONTRACTOR LAYOUT, REINFORCEMENT, CONNECTION DETAILS, SUPPORT ITEMS, DIMENSIONS, AND RELATIONSHIP TO ADJACENT MATERIALS PRIOR TO FABRICATION/INSTALLATION.

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SEALS	CONSULTANT	BID READY	ABERT FILTRATION PLANT FILTER REHABILITATION CITY OF LYNCHBURG, VIRGINIA	HSM&M ARCHITECTS ENGINEERS PLANNERS HAYES, SEAY, MATTERN & MATTERN, INC. 1315 FRANKLIN ROAD ROANOKE, VA 24016 (540) 857-3100 WWW.HSM&M.COM	REV. DATE DESCRIPTION APP. COMM. NO. 60308A ISSUE DATE: DEC. 19, 2003 DESIGNED BY: JAW DRAWN BY: REM CHECKED BY: DMH SUBMITTED BY: RFC © HAYES, SEAY, MATTERN & MATTERN, INC., 2003. ALL RIGHTS RESERVED.	DEMOLITION MASONRY REPAIRS	D2
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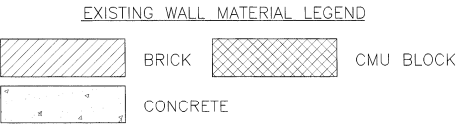
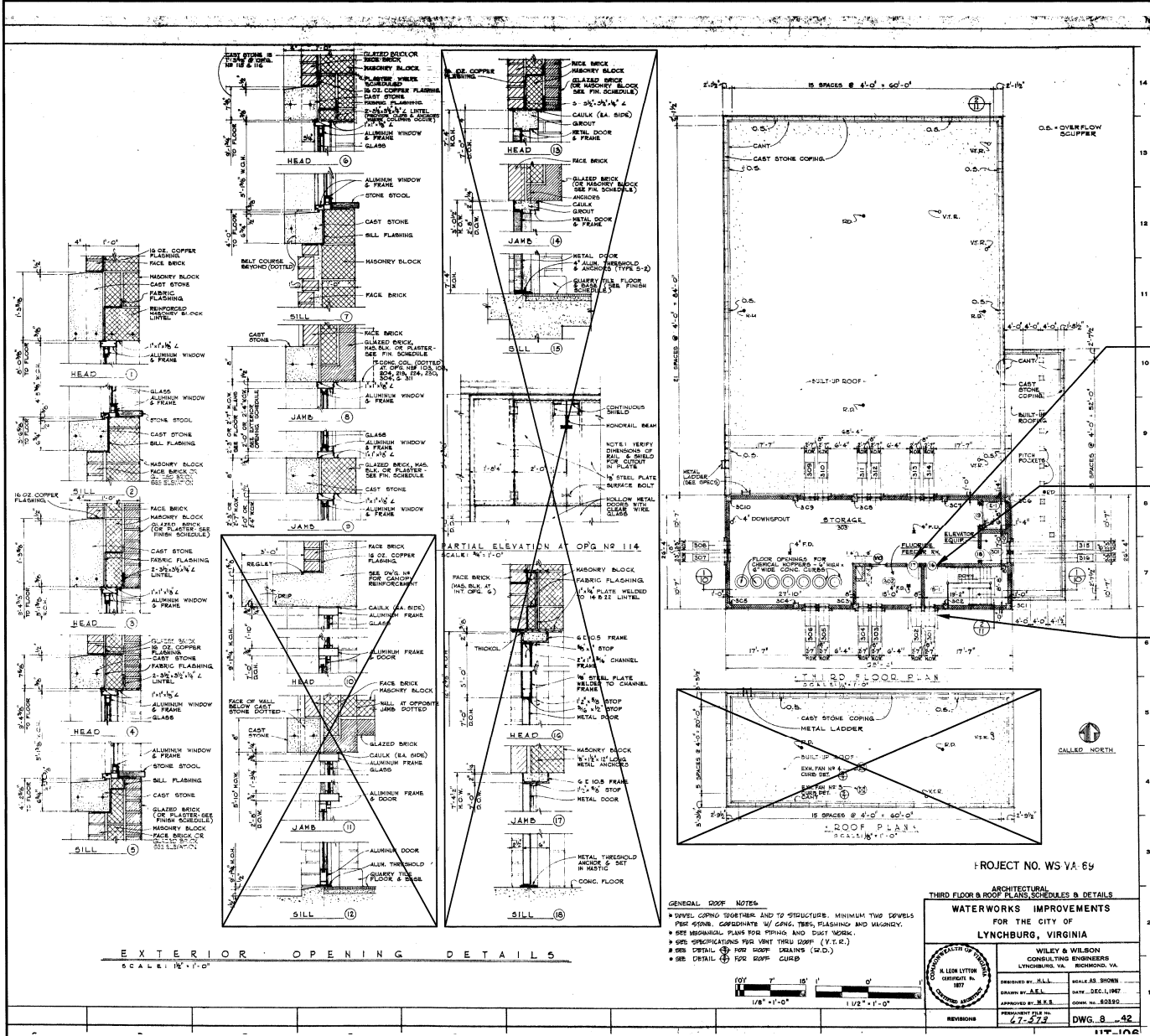




- THIS DRAWING IS NOT SHOWN TO SCALE
1. BASE BID - REPLACE ALL WINDOWS ON SECOND FLOOR, 40 TOTAL. REFER TO SECOND FLOOR PLAN, THIS SHEET, FOR LOCATION AND TO DRAWING D5 FOR WINDOW SCHEDULE. REFER TO SHEET D5 FOR HEAD, JAMB, AND SILL CONDITION.
2. BASE BID - PROVIDE AND INSTALL NEW LOCKSETS AND REHANG DOOR. INDICATED.
3. BID ITEM 4 - REMOVE AND REPLACE QUARRY TILE FLOOR WHERE DIRECTED BY OWNER'S REPRESENTATIVE. MOISTURE ABSORPTION, SIZE, SHAPE, EDGE, COLOR, AND SURFACE FINISH OF TILE TO MATCH EXISTING. PROTECT SURROUNDING WORK FROM DAMAGE OR DISFIGURATION. INSTALLATION METHODS AND MATERIALS TO MATCH EXISTING, IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. MAKE JOINTS WATER TIGHT, WITHOUT VOIDS, CRACKS, EXCESS MORTAR, OR EXCESS GROUT. SOUND TILE AFTER SETTING. REPLACE HOLLOW SOUNDING UNITS. CLEAN TILE AND GROUT SURFACES ACCORDING TO TILE MANUFACTURER'S RECOMMENDATIONS.
4. BID ITEM 5 - REPAINT ALL VISIBLE CMU WALL SURFACES INSIDE FOUR ROOMS ON SECOND FLOOR.
5. BASE BID - IN OFFICE & LABORATORY, PAINT THE DOOR AND FRAME, WINDOW FRAMES, WOOD CASING AROUND 7" OPENING TO NEW CONTROL ROOM (NOT SHOWN), THREE CONCRETE COLUMNS, AND EXPOSED CONDUIT (ONE FLOOR TO CEILING CONDUIT). DO NOT PAINT CASEWORK. IN MOTOR CONTROL ROOM, PAINT THE DOOR AND FRAME, WINDOW FRAMES, WOOD CASING AROUND 7" OPENING TO NEW CONTROL ROOM (NOT SHOWN), AND ONE CONCRETE COLUMN. IN THE TOILET ROOM, PAINT THE IN DOOR, IN DOOR FRAME AND ONE CEILING. REFER TO LEAD PAINT REPORT APPENDED TO SPECIFICATIONS.
6. BASE BID - RESTORE SUSPENDED CEILING. CLEAN ALL SUSPENDED CEILING GRID WITH AMMONIA-BASED SPRAY CLEANSER AND REPLACE ALL SUSPENDED CEILING TILE. TILE WORK INCLUDES REMOVAL AND DISPOSAL OF EXISTING CEILING TILE. ENTIRE SECOND FLOOR EXCEPT CHEMICAL ROOM AND CHLORINATOR ROOM HAS SUSPENDED CEILING. ACOUSTIC TILE SIZE, THICKNESS, COMPOSITION, DENSITY, LIGHT REFLECTANCE, ARC RANGE, STC RANGE, JOINT, EDGE, AND SURFACE COLOR TO MATCH EXISTING. INSTALL ACT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. FIT ACT IN PLACE, FREE FROM DAMAGED EDGES OR OTHER DEFECTS DETRIMENTAL TO APPEARANCE AND FUNCTION. LAY UNITS TO MATCH EXISTING GRID. INSTALL ACT UNITS LEVEL, IN UNIFORM PLANE, AND FREE FROM TWIST, WARP, AND DENTS. PROVIDE OWNER WITH ONE TILE PER 100 IN UNOPENED CARTONS AS EXTRA MATERIALS.

SEALS	CONSULTANT	BID READY	ABERT FILTRATION PLANT FILTER REHABILITATION CITY OF LYNCHBURG, VIRGINIA	HSMMA ARCHITECTS ENGINEERS PLANNERS HAYES, SEAY, MATTERN & MATTERN, INC. 1315 FRANKLIN ROAD ROANOKE, VA 24016 (540) 857-3100 WWW.HSMMA.COM	REV. DATE DESCRIPTION APP. COMM NO. 60308A ISSUE DATE: DEC. 19, 2003 DESIGNED BY: JAW DRAWN BY: REM CHECKED BY: RMG SUBMITTED BY: RPC © HAYES, SEAY, MATTERN & MATTERN, INC., 2003. ALL RIGHTS RESERVED.	DEMOLITION DOORS, WINDOWS, FLOORS & CEILING REPAIR & PAINTING 2nd FLOOR	D4
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SCHEDULE OF EXTERIOR OPENINGS							
EXISTING OPENING NUMBER	EXISTING OPENING SIZE			DETAIL NUMBER			REMARKS
	WIDTH	HEIGHT	HEAD	JAMB	SILL		
102	2'-4"	5'-1 3/8"	6	8.9	7	2	
103	2'-4"	5'-1 3/8"	6	8.9	7	2	
104	2'-4"	5'-1 3/8"	6	8.9	7	1	
105	2'-4"	5'-1 3/8"	6	8.9	7	1	
106	2'-4"	5'-1 3/8"	6	8.9	7	1	
107	2'-4"	5'-1 3/8"	6	8.9	7	1	
108	2'-4"	5'-1 3/8"	6	8.9	7	1	
109	2'-4"	5'-1 3/8"	6	8.9	7	1	
110	2'-4"	5'-1 3/8"	6	8.9	7	1	
111	2'-4"	5'-1 3/8"	6	8.9	7	1	
112	2'-4"	5'-1 3/8"	6	8.9	7	1	
113	2'-4"	5'-1 3/8"	6	8.9	7	1	
115	2'-4"	5'-1 3/8"	6	8.9	7	1	
116	2'-4"	5'-1 3/8"	6	8.9	7	1	
201	2'-4"	5'-1 3/8"	4	8.9	5	2	
202	2'-4"	5'-1 3/8"	4	8.9	5	1	
203	2'-4"	5'-1 3/8"	4	8.9	5	1	
204	2'-4"	5'-1 3/8"	4	8.9	5	1	
205	2'-4"	5'-1 3/8"	4	8.9	5	1	
206	2'-4"	5'-1 3/8"	4	8.9	5	1	
207	2'-0"	5'-1 3/8"	4	8.9	5	1	
208	2'-0"	5'-1 3/8"	4	8.9	5	1	
210	2'-4"	5'-1 3/8"	3	8.9	5	1	
211	2'-4"	5'-1 3/8"	3	8.9	5	1	
212	2'-4"	5'-1 3/8"	3	8.9	5	1	
213	2'-4"	5'-1 3/8"	3	8.9	5	1	
214	2'-4"	5'-1 3/8"	3	8.9	5	1	
215	2'-4"	5'-1 3/8"	3	8.9	5	1	
216	2'-4"	5'-1 3/8"	3	8.9	5	1	
217	2'-4"	5'-1 3/8"	3	8.9	5	1	
218	2'-4"	5'-1 3/8"	3	8.9	5	1	
219	2'-4"	5'-1 3/8"	3	8.9	5	1	
220	2'-4"	5'-1 3/8"	3	8.9	5	1	
221	2'-4"	5'-1 3/8"	3	8.9	5	1	
222	2'-4"	5'-1 3/8"	3	8.9	5	1	
223	2'-4"	5'-1 3/8"	3	8.9	5	1	
224	2'-4"	5'-1 3/8"	3	8.9	5	1	
225	2'-4"	5'-1 3/8"	3	8.9	5	1	
226	2'-4"	5'-1 3/8"	3	8.9	5	2	
227	2'-4"	5'-1 3/8"	3	8.9	5	2	
228	2'-4"	5'-1 3/8"	3	8.9	5	2	
229	2'-4"	5'-1 3/8"	3	8.9	5	2	
230	2'-4"	5'-1 3/8"	3	8.9	5	2	
231	2'-4"	5'-1 3/8"	3	8.9	5	2	
232	2'-4"	5'-1 3/8"	3	8.9	5	2	
233	2'-4"	5'-1 3/8"	3	8.9	5	2	
234	2'-4"	5'-1 3/8"	3	8.9	5	1	
235	2'-4"	5'-1 3/8"	3	8.9	5	1	
236	2'-4"	5'-1 3/8"	3	8.9	5	1	
237	2'-4"	5'-1 3/8"	3	8.9	5	1	
238	2'-4"	5'-1 3/8"	3	8.9	5	1	
239	2'-4"	5'-1 3/8"	3	8.9	5	1	
240	2'-0"	5'-1 3/8"	4	8.9	5	1	
241	2'-0"	5'-1 3/8"	4	8.9	5	1	
301	2'-4"	4'-5 3/8"	1	8.9	2	2	
302	2'-4"	4'-5 3/8"	1	8.9	2	1	
303	2'-4"	4'-5 3/8"	1	8.9	2	1	
304	2'-4"	4'-5 3/8"	1	8.9	2	1	
305	2'-4"	4'-5 3/8"	1	8.9	2	1	
306	2'-4"	4'-5 3/8"	1	8.9	2	1	
307	2'-0"	4'-5 3/8"	1	8.9	2	1	
308	2'-0"	4'-5 3/8"	1	8.9	2	1	

2 PROVIDE NEW LOCKSET ON DOOR 17 (IS NOW DOUBLE DOOR, NOT SHOWN), AND REHANG DOOR. ADJUST DOOR/HARDWARE AS REQ'D TO MAKE FLUSH AND PLUMB WITH EXISTING FRAME. OPENING IS 6'-0"x7'-0".

2 REHANG DOOR 16. ADJUST DOOR/HARDWARE AS REQUIRED TO MAKE FLUSH AND PLUMB WITH EXISTING FRAME.

1 REPLACE WINDOWS, TYP OF 8

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- THIS DRAWING IS NOT SHOWN TO SCALE
- 1 BASE BID - REPLACE WINDOWS 301 THROUGH 308, 8 TOTAL. REFER TO THIRD FLOOR PLAN, THIS SHEET, FOR LOCATION AND TO DRAWING D5 FOR WINDOW SCHEDULE. REFER TO SHEET D5 FOR HEAD, JAMB, AND SILL CONDITION.
- 2 BASE BID - PROVIDE AND INSTALL NEW LOCKSETS ON DOORS INDICATED.

CONSULTANT

**BID READY**

**ABERT FILTRATION PLANT  
FILTER REHABILITATION**

CITY OF LYNCHBURG, VIRGINIA

**HSM**

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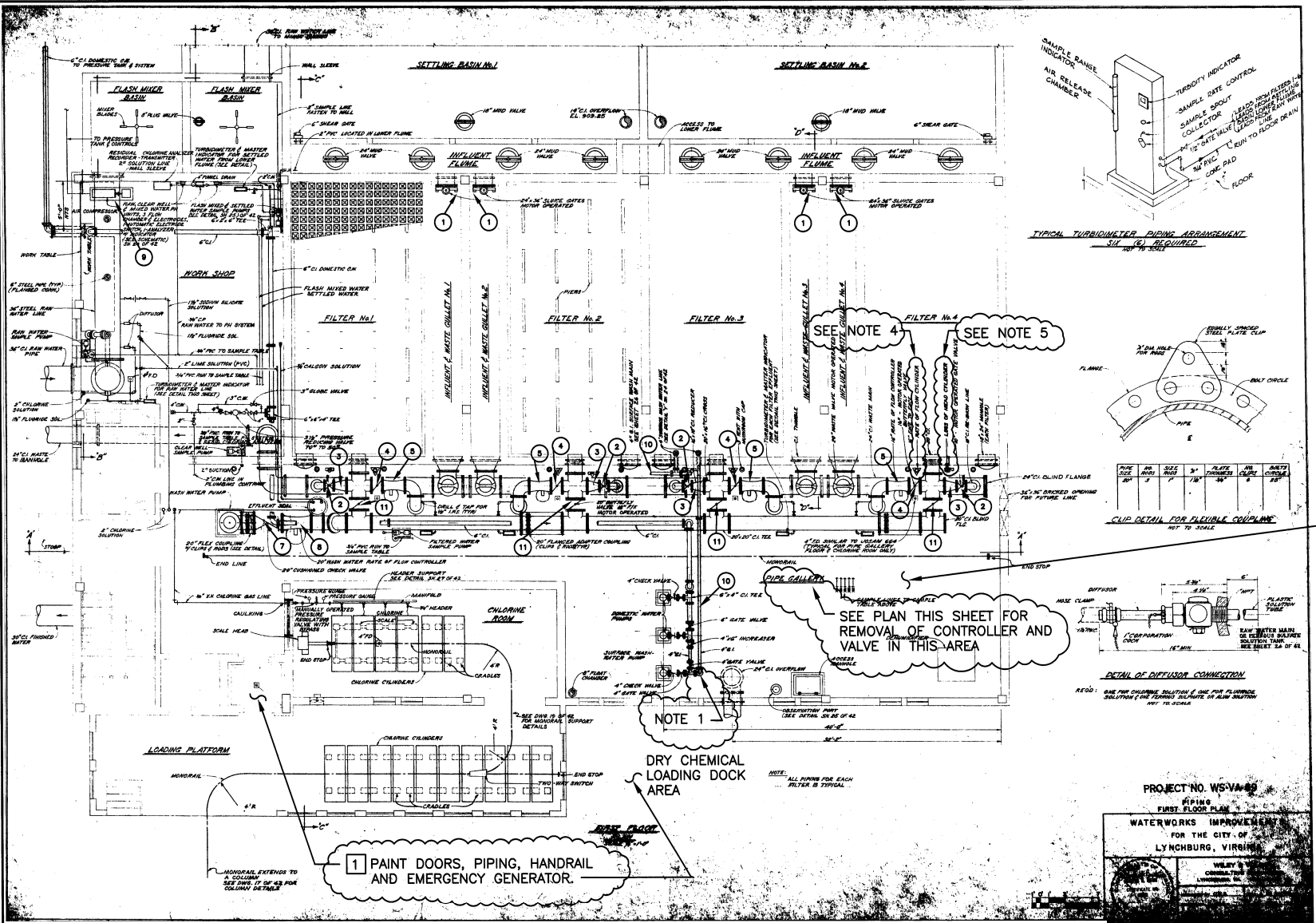
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DEMOLITION

DOORS, WINDOWS & PAINTING  
3rd FLOOR

**D5**



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**1** BASE BID - PAINT IDENTIFIED METAL ITEMS ON FIRST FLOOR. PAINT PUMPS, PIPING, AND VALVES, WINDOW FRAMES IN CHLORINE ROOM, MANHOLE COVERS INTO FILTER HEADSPACE, ELECTRICAL PANELS, POTASSIUM PERMANGANATE TANK FRAME, CLEARWELL ACCESS MANHOLE COVER AND LADDER, CONDUIT ADJACENT TO WALLS, DO NOT PAINT TURBIDIMETER STANDS, MANHOLE BEAM, SUCTORWORK, STAINLESS STEEL SURFACES, NON-METALLIC PIPE, EMERGENCY EXHAUST, UNIT HEATERS, CEILING, FLOOR DRAIN PIPE NEAR CEILING, AND CONDUIT ADJACENT TO CEILING. REFER TO DRAWING D3 FOR LOCATION OF CHLORINE ROOM WINDOWS. REFER TO DRAWING D7 FOR ELEVATION VIEW OF PIPING AT LOADING DOCK AREA. PAINT CHLORINE ROOM DOORS, ELEVATOR DOORS, DOOR INTO LOBBY, FLOOR DRAIN PIPE AT CEILING, GRAVITY DAMPER INTO CHLORINE ROOM. PAINT 7" OF HANDRAIL (INCLUDING TWO RAIL AND THREE POSTS) AT DRY CHEMICAL LOADING DOCK. PAINT EMERGENCY GENERATOR ENCLOSURE. REFER TO LEAD-IN PAINT SURVEY REPORT APPENDED TO SPECIFICATIONS.

EXISTING EQUIPMENT AND STRUCTURES REMOVED BY CONTRACTOR AND DISPOSED OF OFF SITE	
KEY DESCRIPTION	
1	24" X 36" SLUICE GATE (TYP OF 4) (SEE NOTE 3)
2	10" GATE VALVE AND MOTOR OPERATOR, FLG X FLG (TYP OF 4)
3	16" X 10" REDUCER, FLG X FLG (TYP OF 4)
4	16" BUTTERFLY VALVE AND MOTOR OPERATOR, FLG X FLG (TYP OF 5)
5	16" RATE OF FLOW CONTROLLER, FLG X FLG (TYP OF 5)
6	16" CHECK VALVE, FLG X FLG
7	20" CHECK VALVE (TYP OF 1)
8	20" DIRECT ACTING RATE OF FLOW CONTROLLER (TYP OF 1)
9	EXIST CONCRETE EQUIPMENT PAD, (3 PADS, 4" HIGH BY 10 SF; EACH PAD)
10	4" WATER SUPPLY PIPE TO SURFACE WASHERS (BID ADDITIVE 1)
11	20" BUTTERFLY VALVE AND MOTOR OPERATOR (TYP OF 4)

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CONSULTANT

**BID READY**

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FILTER REHABILITATION**

CITY OF LYNCHBURG, VIRGINIA

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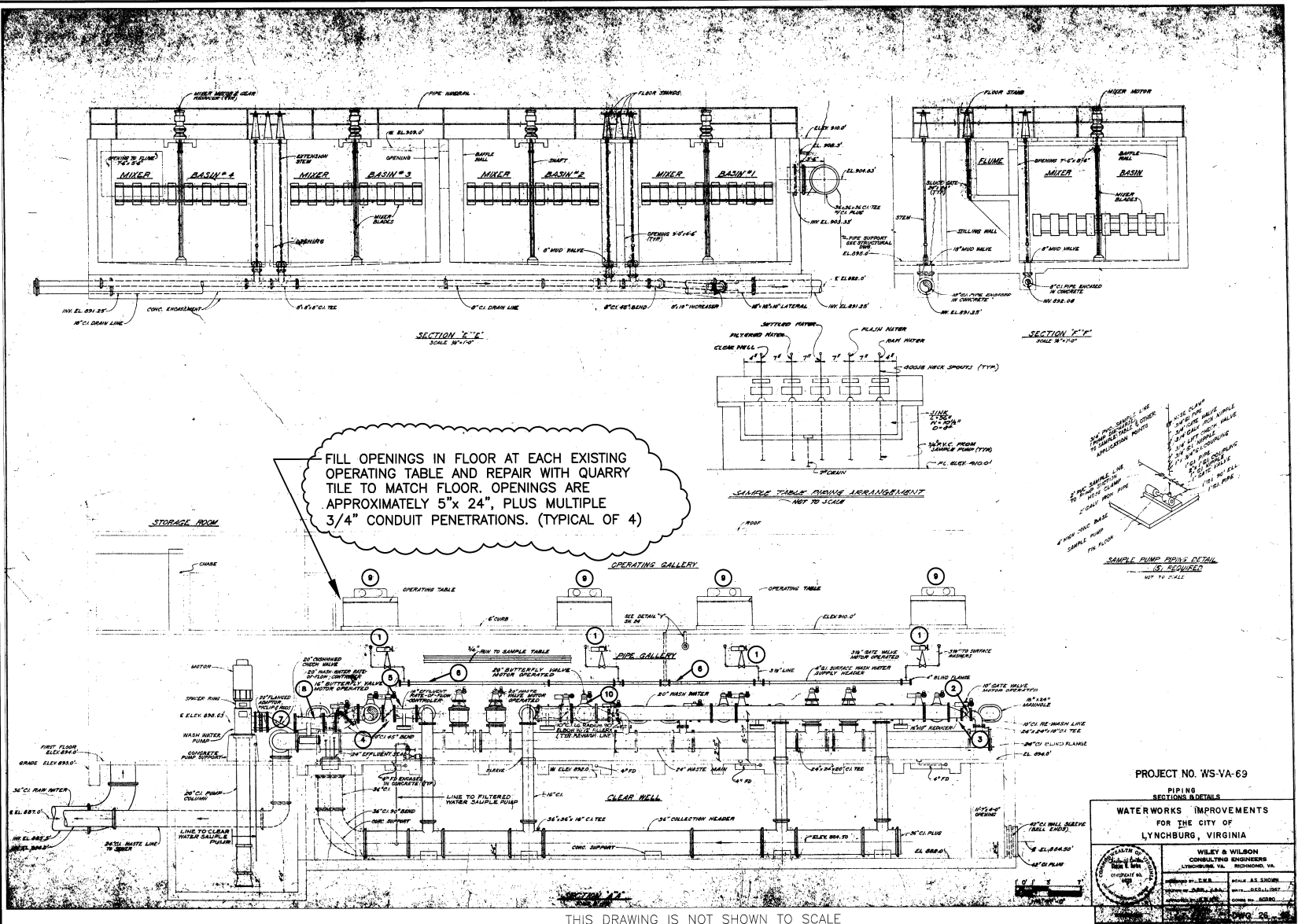
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DEMOLITION

**FILTER PIPE GALLERY  
DEMOLITION AND PAINTING,  
PLAN**

**D6**



PROJECT NO. WS-VA-69

WILEY & WILSON  
CONSULTING ENGINEERS  
LYNCHBURG, VA. 24502

WILEY & WILSON  
CONSULTING ENGINEERS  
LYNCHBURG, VA. 24502

NOTE:  
SEE SHEET P1 AND P2 FOR NEW VALVES, ACTUATORS AND FLOW METERS.

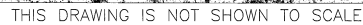
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EXISTING EQUIPMENT REMOVED BY CONTRACTOR AND DISPOSED OF OFF SITE	
KEY DESCRIPTION	
1	SURFACE WASH PIPING, VALVES, AND OPERATORS (TYP OF 4) (BID ADDITIVE 1)
2	10" GATE VALVE (SEE SHEET D2 FOR QUANTITY)
3	16" X 10" REDUCER (SEE SHEET D2 FOR QUANTITY)
4	16" BUTTERFLY VALVE AND MOTOR OPERATOR (SEE SHEET D2 FOR QUANTITY)
5	16" RATE FLOW CONTROLLER (SEE SHEET D2 FOR QUANTITY)
6	4" SURFACE WASH WATER SUPPLY HEADER (BID ADDITIVE 1)
7	20" CHECK VALVE (SEE SHEET D2 FOR QUANTITY)
8	20" DIRECT ACTING RATE OF FLOW CONTROLLER (SEE SHEET D2 FOR QUANTITY)
9	OPERATING TABLE (TYP OF 4) AND RELATED WIRING AND CONDUIT BACK TO EXISTING ELECTRICAL PANEL
10	20" BUTTERFLY VALVE AND MOTOR OPERATOR (SEE SHEET D2 FOR QUANTITY)

SEALS	CONSULTANT	BID READY	ABERT FILTRATION PLANT FILTER REHABILITATION CITY OF LYNCHBURG, VIRGINIA	HSMM ARCHITECTS ENGINEERS PLANNERS HAYES, SEAY, MATTERN & MATTERN, INC. 1515 FRANKLIN ROAD ROANOKE, VA 24016 (540) 857-3100 WWW.HSMM.COM	REV DATE DESCRIPTION APP COMM NO: 80308A ISSUE DATE: DEC. 19, 2003 DESIGNED BY: WCH DRAWN BY: REM CHECKED BY: DMH SUBMITTED BY: RFC © HAYES, SEAY, MATTERN & MATTERN, INC., 2003. ALL RIGHTS RESERVED.	DEMOLITION FILTER PIPE GALLERY DEMOLITION AND PAINTING, SECTIONS	D7
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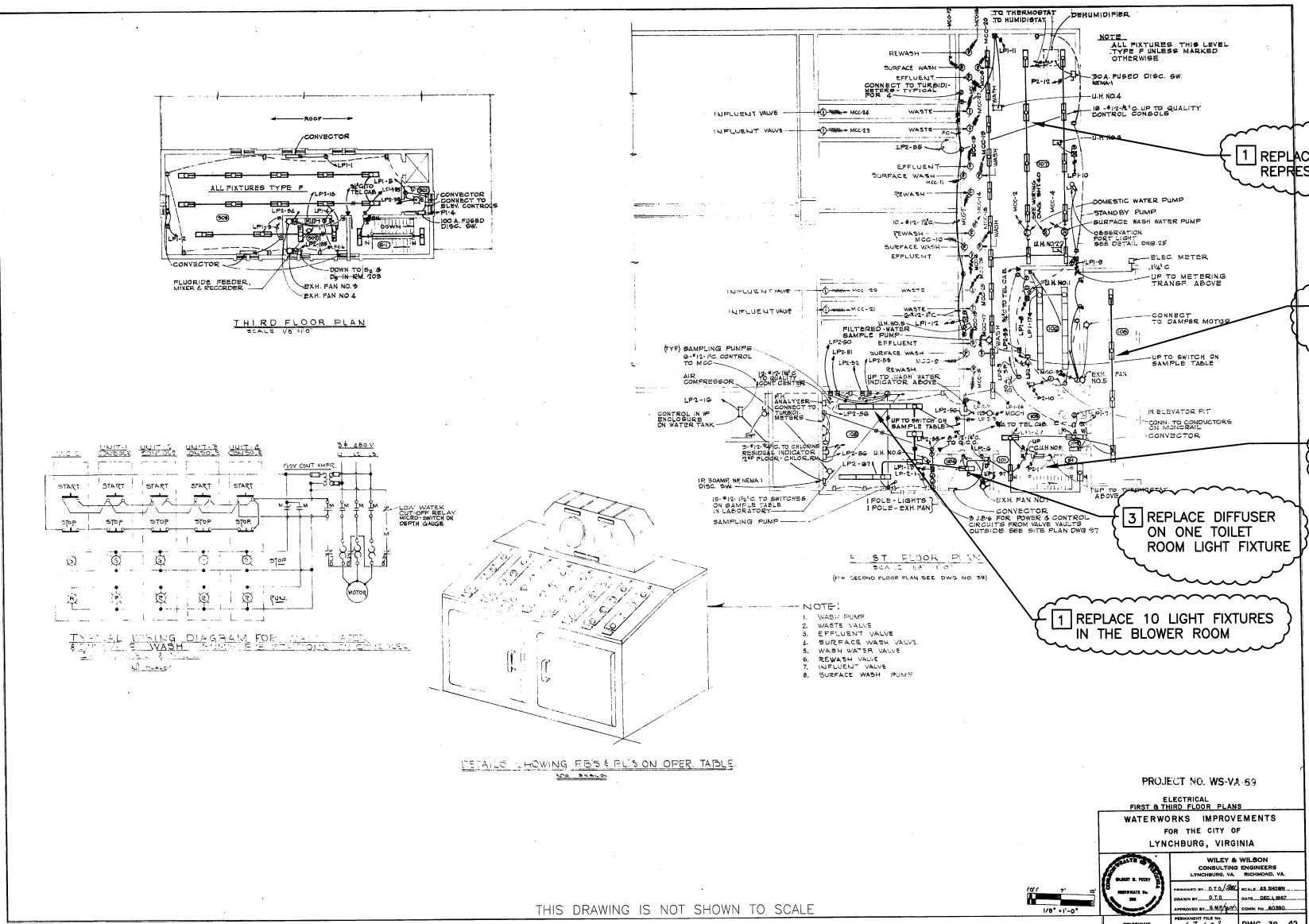


DEMOLITION DRAWING GENERAL NOTE:

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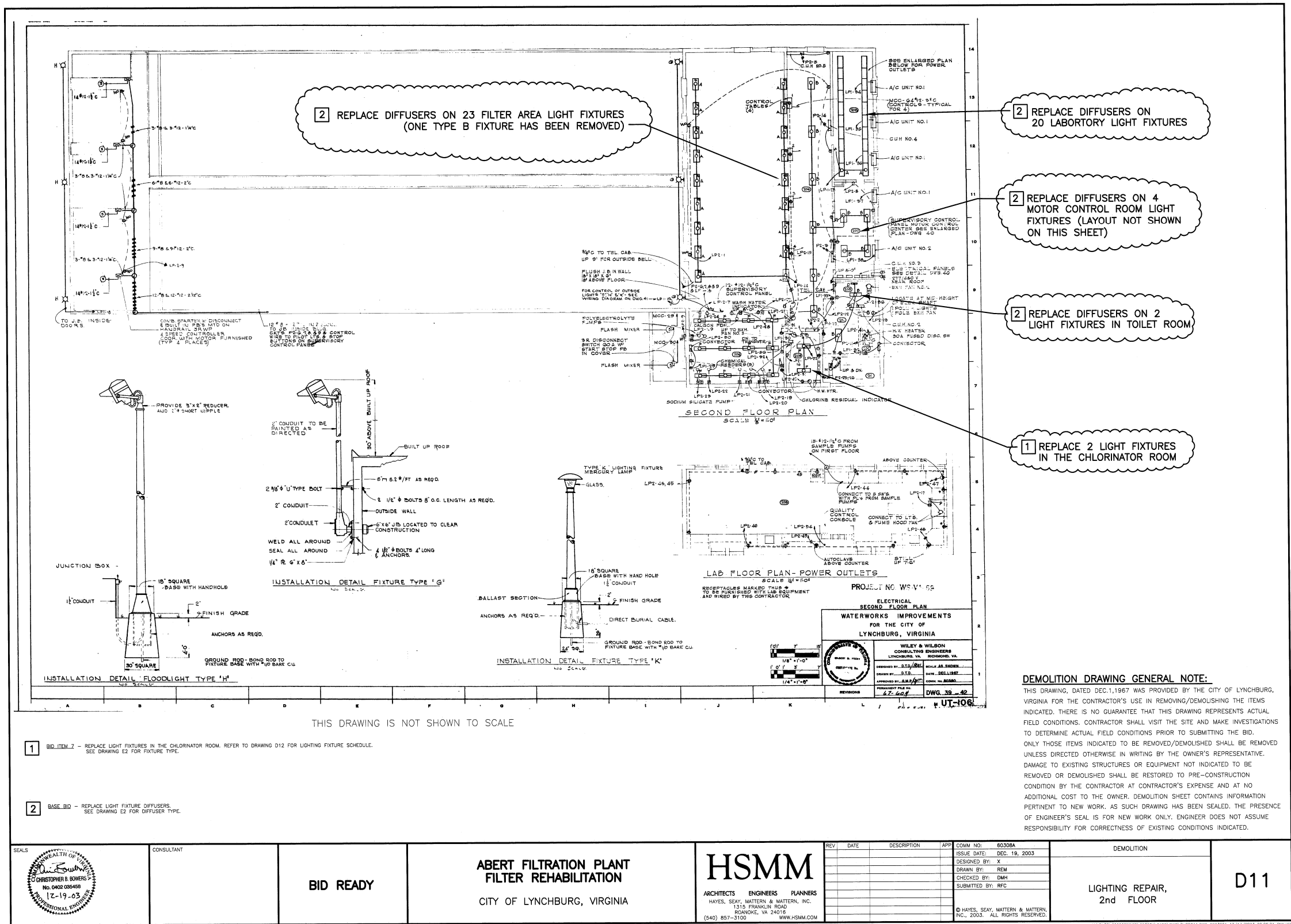


- 1 REPLACE 10 LIGHT FIXTURES DESIGNATED BY OWNER'S REPRESENTATIVE IN THE PIPE GALLERY
- 1 REPLACE 4 LIGHT FIXTURES AT LOADING DOCK
- 2 REPLACE 5 LIGHT FIXTURES IN STAIR. SEE ALSO SECOND FLOOR PLAN ON DRAWING D11 AND THIRD FLOOR PLAN THIS SHEET
- 3 REPLACE DIFFUSER ON ONE TOILET ROOM LIGHT FIXTURE
- 1 REPLACE 10 LIGHT FIXTURES IN THE BLOWER ROOM

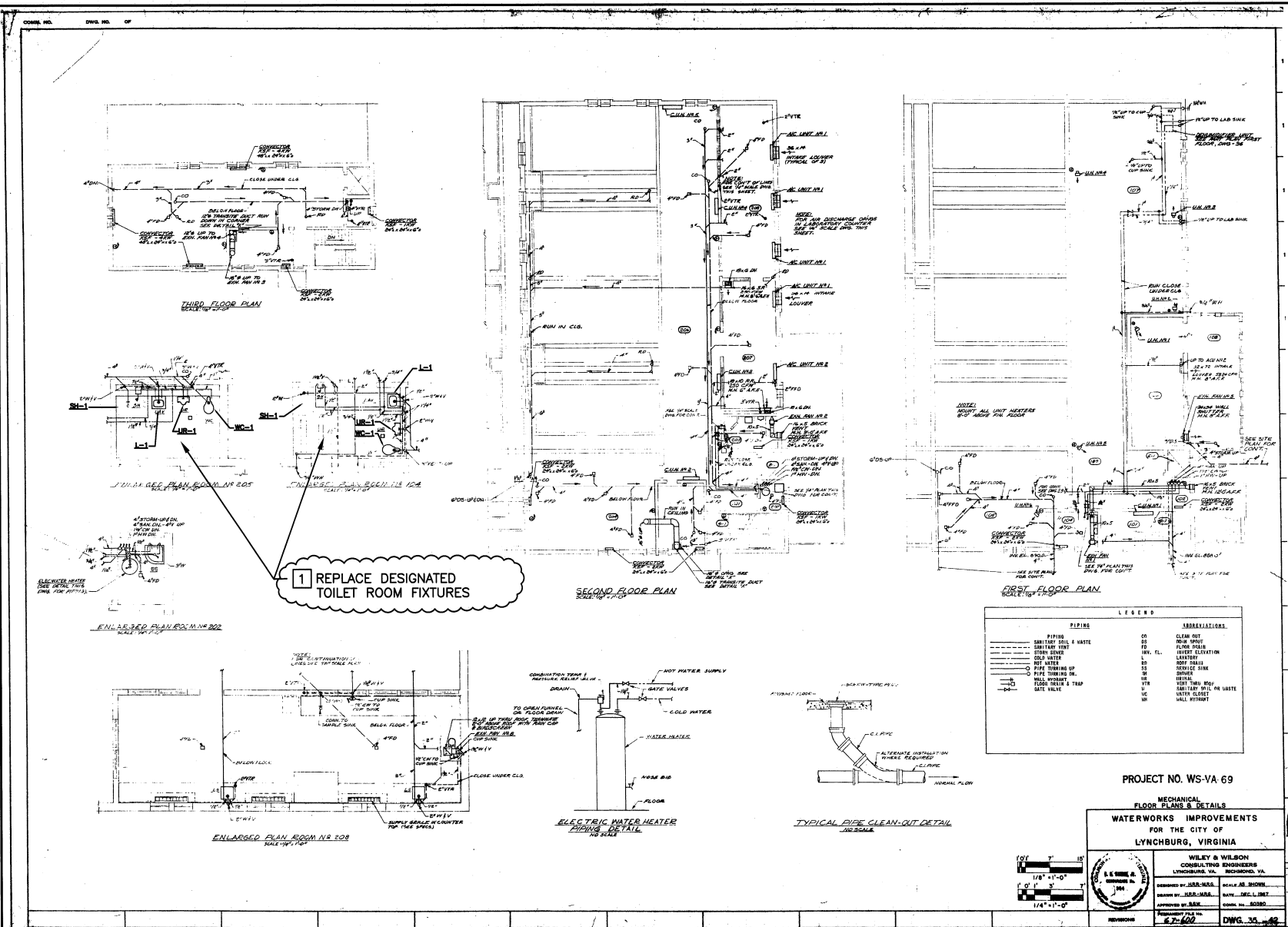
- 1 BID ITEM 7 - REPLACE LIGHT FIXTURES IN THE BLOWER ROOM, FILTER GALLERY AND LOADING DOCK. REFER TO DRAWING D12 FOR LIGHTING PANEL SCHEDULE. SEE DRAWING E2 FOR FIXTURE TYPES
- 2 BASE BID - REPLACE LIGHT FIXTURES IN STAIR. REFER TO DRAWING D12 FOR LIGHTING PANEL SCHEDULE. SEE DRAWING E2 FOR FIXTURE TYPES
- 3 BASE BID - REPLACE LIGHT FIXTURE DIFFUSER. SEE DRAWING E2 FOR DIFFUSER TYPES

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PLUMBING FIXTURE SCHEDULE							
MARK	FIXTURE DESCRIPTION	MOUNTING HEIGHT	COLD WATER	HOT WATER	TRAP	DRAIN	VENT
WC-1	NOTE 4	15"	1"	-	-	4"	2"
UR-1	NOTE 5	24"	1"	-	-	2"	1 1/2"
L-1	NOTE 6	34"	1/2"	1/2"	1 1/4"	2"	1 1/2"
SH-1	NOTE 7	42"(NOTE 3)	1/2"	1/2"	2"	2"	1 1/2"

NOTES:

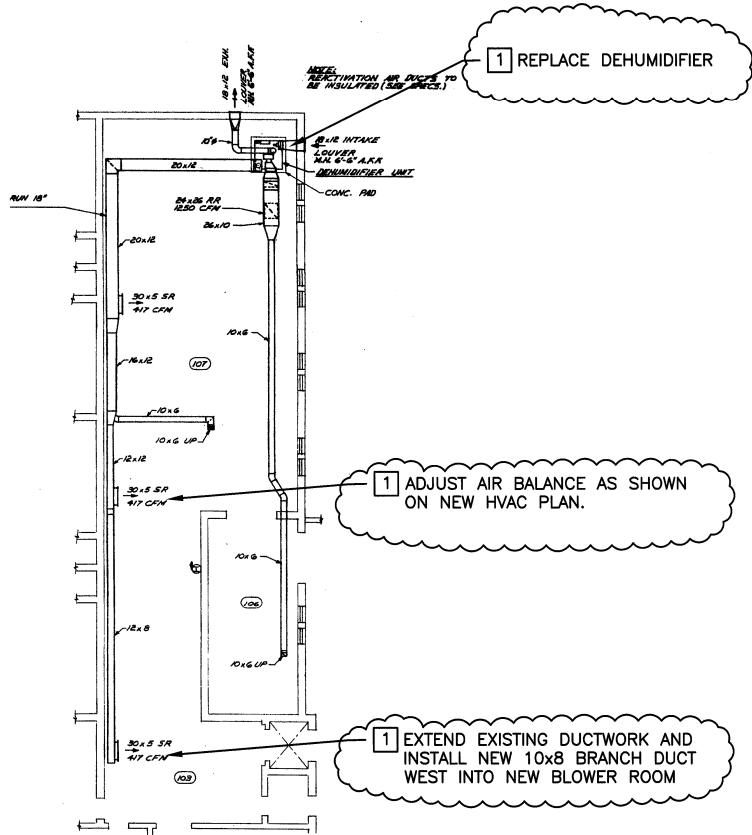
- SIZES GIVEN ABOVE ARE FOR ONE FIXTURE ONLY. ANY EXCEPTIONS ARE SHOWN ON PLANS.
- MOUNTING HEIGHTS GIVEN ARE TO FLOOD LEVEL RIM OF FIXTURE UNLESS NOTED OTHERWISE.
- MOUNTING HEIGHT IS TO CENTERLINE OF MIXING VALVE. MOUNT TOP OF SIDE BURN AT 60" AFF.
- ELJER - "SIGNATURE" 17" #111-2145 1.6 GPF WATER CLOSET W/ ELONGATED RIM. SLOAN - "ROYAL" #1111 FLUSH VALVE. (NO SUBSTITUTION ALLOWED)
- ELJER - "SAVON" #161-1090 1.0 GPF URINAL. (OR EQUAL) SLOAN - "ROYAL" #180-1 FLUSH VALVE. (NO SUBSTITUTION ALLOWED)
- ELJER - "SIGNATURE" #051-2101 LAVATORY. (OR EQUAL) CHICAGO - #404A-317 FAUCET. (OR EQUAL)
- LASCO - #1382-NAC SHOWER STALL. (OR EQUAL) CHICAGO - #1762 SHOWER HEAD. (OR EQUAL)

1 BASE BID - REPLACE DESIGNATED TOILET ROOM FIXTURES. IN BOTH TOILET ROOMS, REPLACE LAVATORY, SHOWER STALL, FIXTURES, PARTITIONS AND ACCESSORIES AT LAVATORY AND WATER CLOSET. WORK INCLUDES REMOVAL AND DISPOSAL OF EXISTING FIXTURES.

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PROJECT NO. WS-VA-69

MECHANICAL SCHEDULES & DETAILS

WATERWORKS IMPROVEMENTS FOR THE CITY OF LYNCHBURG, VIRGINIA

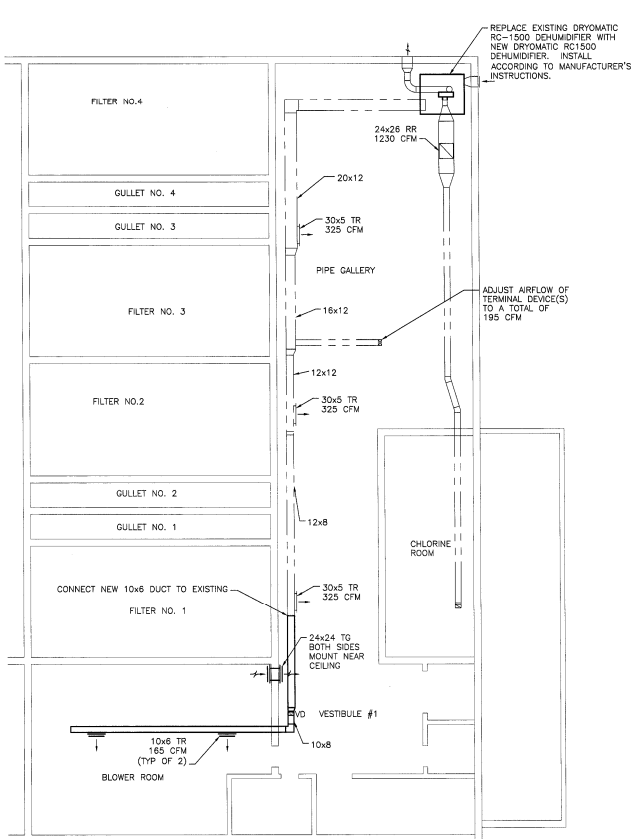
WILEY & WILSON CONSULTING ENGINEERS LYNCHBURG, VA. RICHMOND, VA.

DESIGNED BY: M.B.A. H.A.A. SCALE AS SHOWN  
CHECKED BY: M.B.A. H.A.A. DATE: DEC. 1, 1967  
APPROVED BY: M.B.A. H.A.A. DATE: DEC. 1, 1967

DWG. NO. 38-98

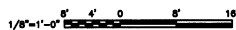
THIS DRAWING IS NOT SHOWN TO SCALE

1 BASE BID - REPLACE DEHUMIDIFIER AND EXTEND DUCTWORK. WORK INCLUDES REMOVAL AND DISPOSAL OF EXISTING DEHUMIDIFIER AND EXTENDING DEHUMIDIFIER AIR DUCT INTO THE BLOWER ROOM. AIR BALANCE PER TERMINAL DEVICES SHALL BE ADJUSTED AS SHOWN.



#### MECH NEW HVAC PLAN

SCALE: 1/8" = 1'-0"



#### HVAC LEGEND

VOLUME DAMPER	
TOP REGISTER	
TOP GRILLE	
EXISTING DUCTWORK	
DUCTWORK	

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#### SPECIFICATIONS

##### DUCTWORK

###### A. GENERAL

- DUCTWORK CONSTRUCTION, METHOD OF REINFORCING, GAGE, AND OTHER FEATURES AS RECOMMENDED IN SMACNA-HDCS EXCEPT AS OTHERWISE SPECIFIED.
- DIMENSIONS INDICATED ARE INSIDE CLEAR DIMENSIONS.
- PROVIDE DUCTWORK STRAIGHT AND SMOOTH ON THE INSIDE, WITH JOINTS NEATLY FINISHED.
- PROVIDE DOUBLE THICKNESS TURNING VANES WHERE MITERED ELBOWS ARE INDICATED.
- INCREASE DUCT SIZES GRADUALLY, NOT EXCEEDING 15-DEGREE DIVERGENCE WHEREVER POSSIBLE; MAXIMUM 30-DEGREE DIVERGENCE UPSTREAM OF EQUIPMENT AND 45-DEGREE CONVERGENCE DOWNSTREAM.
- PROVIDE STANDARD 45-DEGREE ENTRY BRANCH CONNECTIONS ON RECTANGULAR DUCTWORK.

###### B. INSTALLATION

- INSTALL DUCTS AND ACCESSORIES IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS, NFPA 90A, AND SMACNA-HDCS.
- PROVIDE DUCT TEST HOLES WHERE REQUIRED FOR TESTING OF SYSTEMS.
- LOCATE DUCTS WITH SUFFICIENT SPACE AROUND EQUIPMENT TO ALLOW NORMAL OPERATING AND MAINTENANCE ACTIVITIES.
- USE DOUBLE NUTS AND LOCK WASHERS ON THREADED ROD SUPPORTS.
- SLOPE HORIZONTAL SUPPLY DUCTWORK FROM DEHUMIDIFICATION UNIT A MINIMUM 1/2" PER FOOT DOWNWARD AWAY FROM MACHINE TO PREVENT LIQUID MOISTURE FROM DRAINING INTO THE MACHINE.
- DURING CONSTRUCTION PROVIDE TEMPORARY CLOSURES OF METAL OR TAPED POLYETHYLENE ON OPEN DUCTWORK TO PREVENT CONSTRUCTION DUST FROM ENTERING DUCTWORK SYSTEM.
- THE REACTIVATION AIR OUTLET DUCT SHALL BE INSULATED AND CONSIDERED A HOT STOVE PIPE WITH RESPECT TO WALLS, AND INSULATED FROM THE BUILDING STRUCTURE ACCORDINGLY.
- THE OUTSIDE ENDS OF THE DUCTS SHALL BE COVERED WITH INSECT SCREEN.

##### VOLUME DAMPERS

- A. SINGLE-BLADE DAMPERS: FABRICATE FOR DUCT SIZES UP TO 6 BY 30 INCHES. USE MULTI-BLADE DAMPER FOR LARGER DUCT SIZES. TOP GRILLES SAME, BUT SUPPLIED WITHOUT INTEGRAL DAMPER.
- B. MULTI-BLADE DAMPER: FABRICATE OF OPPOSED-BLADE PATTERN WITH MAXIMUM BLADE SIZES 8 BY 72 INCHES. ASSEMBLE CENTER- AND EDGE-CRIMPED BLADES IN PRIME-COATED OR GALVANIZED CHANNEL FRAME WITH SUITABLE HARDWARE.
- C. END BEARINGS: PROVIDE END BEARINGS. ON MULTIPLE BLADE DAMPERS, PROVIDE OIL-IMPREGNATED NYLON OR SINTERED-BRONZE BEARINGS.

##### DUCTWORK INSULATION, RIGID TYPE FG-B

- A. SECURE INSULATION TO DUCTWORK USING MECHANICAL FASTENERS.
- B. LOCATE FASTENERS WITHIN 3 INCHES FROM EACH EDGE AND CORNER OF BOARD ON 12-INCH CENTERS. LOCATE ADDITIONAL FASTENERS AT 12 INCHES ON CENTER EACH WAY. INSTALL ADDITIONAL FASTENERS AT CROSSBRACING TO ENSURE A TIGHT FIT BETWEEN THE INSULATION AND THE DUCT.
- C. ON IRREGULAR SURFACES CUT THE INSULATION BOARDS INTO SEGMENTS AND FASTEN INTO PLACE WITH ALUMINUM BANDS OR MECHANICAL FASTENERS ON 12-INCH CENTERS.
- D. COVER FASTENERS WITH VAPOR SEALING PRESSURE-SENSITIVE PATCHES MATCHING INSULATION FACING TO ENSURE A VAPOR SEAL BARRIER.
- E. SEAL INSULATION JOINTS WITH PRESSURE-SENSITIVE JOINT TAPE, WHICH MATCHES INSULATION FACING TO ENSURE A VAPOR BARRIER SEAL.

##### TERMINAL AIR DEVICES

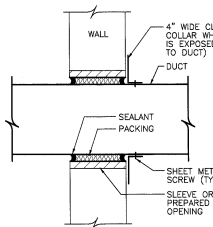
TOP REGISTERS (TR): METAL INDUSTRIES, INC. MODEL H4004, OR TUTTLE & BAILEY MODEL T547, OR TITUS MODEL 300R.

##### TESTING, ADJUSTING AND BALANCING

- A. EXAMINATION: VERIFY THAT SYSTEMS ARE COMPLETE AND OPERABLE BEFORE COMMENCING WORK. ENSURE THE FOLLOWING CONDITIONS:
- SYSTEMS ARE STARTED AND OPERATING IN A SAFE AND NORMAL CONDITION.
  - PROPER THERMAL OVERLOAD PROTECTION IS IN PLACE FOR ELECTRICAL EQUIPMENT.
  - FANS ARE ROTATING CORRECTLY.
  - VOLUME DAMPERS ARE IN PLACE AND OPEN.
  - ACCESS DOORS ARE CLOSED AND DUCT END CAPS ARE IN PLACE.
  - AIR OUTLETS ARE INSTALLED AND CONNECTED.
  - DUCT SYSTEM LEAKAGE IS MINIMIZED.

###### B. INSTALLATION TOLERANCES:

- AIR OUTLETS AND INLETS: ADJUST TOTAL TO WITHIN PLUS 10 PERCENT AND MINUS 5 PERCENT OF DESIGN TO SPACE. ADJUST OUTLETS AND INLETS IN SPACE TO WITHIN PLUS OR MINUS 10 PERCENT OF DESIGN.
- ADJUSTING
1. ENSURE RECORDED DATA REPRESENTS ACTUAL MEASURED OR OBSERVED CONDITIONS.
2. PERMANENTLY MARK SETTINGS OF VALVES, DAMPERS, AND OTHER ADJUSTMENT DEVICES ALLOWING SETTINGS TO BE RESTORED.
3. AFTER ADJUSTMENT, TAKE MEASUREMENTS TO VERIFY BALANCE HAS NOT BEEN DISRUPTED OR THAT SUCH DISRUPTION HAS BEEN RECTIFIED.
4. LEAVE SYSTEMS IN PROPER WORKING ORDER, REPLACING BELT GUARDS, CLOSING ACCESS DOORS, CLOSING DOORS TO ELECTRICAL SWITCH BOXES, AND RESTORING DEHUMIDIFIER CONTROL SETTINGS TO NORMAL RUN CONDITIONS.



#### NOTES:

- PROVIDE NEW DUCT AND RETURN GRILL PENETRATIONS THROUGH EXISTING WALL AS SHOWN.
- DETAIL IS NOT APPLICABLE WHERE FIRE DAMPER, REGISTER, OR DIFFUSER IS PROVIDED.
- PROVIDE SEPARATE AND UNCONNECTED SLEEVES WHERE DUCTS PENETRATE DOUBLE (FLOATING) FLOOR SLABS TO PREVENT "SHORT CIRCUITING" THE VIBRATION ISOLATING MATERIAL.
- EXTERNALLY INSULATED DUCT SHALL BE CAULKED TO PROVIDE A COMPLETE SEAL BETWEEN THE INSULATION AND CLOSURE COLLAR.

#### TYPICAL DUCT PENETRATION THRU WALLS

NO SCALE

SEALS



CONSULTANT

BID READY

ABERT FILTRATION PLANT  
FILTER REHABILITATION  
CITY OF LYNCHBURG, VIRGINIA

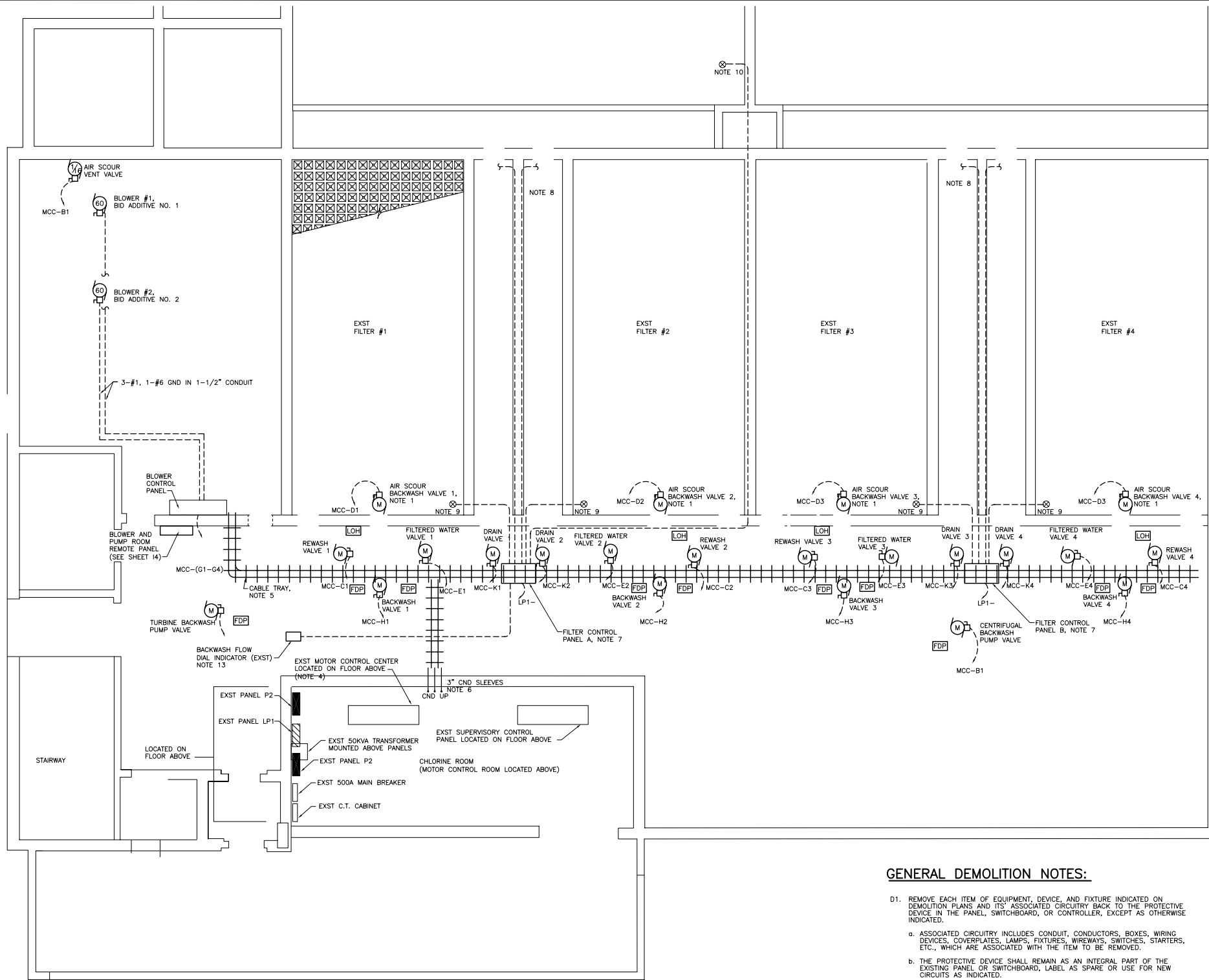
**HSMM**  
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HAYES, SEAY, MATTERN & MATTERN, INC.  
1315 FRANKLIN ROAD  
ROANOKE, VA 24016  
(540) 857-3100 WWW.HSMM.COM

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				60308A
				ISSUE DATE: DEC. 19, 2003
				DESIGNED BY: CSH
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				CHECKED BY: ABC
				SUBMITTED BY: RFD
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DEMOLITION  
DEHUMIDIFICATION  
SYSTEM REPAIRS

D14





FIRST FLOOR FILTER GALLERY PLAN  
SCALE: 1"=50'

ELECTRICAL LEGEND

- CONDUIT RUN CONCEALED IN CEILING OR WALL. HATCHED LINES INDICATE NUMBER OF CURRENT CARRYING CONDUCTORS WHEN OTHER THAN TWO.
- CONDUIT RUN EXPOSED.
- HOME RUN, NUMBER OF ARROWS INDICATE NUMBER OF CIRCUITS. LETTERS AND NUMBERS DESIGNATE PANEL AND CIRCUITS.
- DISCONNECT SWITCH, MH 6"-0" TO TOP, PROVIDE NEMA 3R DISCONNECTS IN ALL LOCATIONS.
- MOTOR ON PIECE OF EQUIPMENT, NUMBER INDICATES HORSEPOWER. - M INDICATES MOTOR CONNECTION.
- PANELBOARD - 208Y/120 VOLT
- PANELBOARD - 480Y/277 VOLT
- 120V DUPLEX RECEPTACLE
- THREE CHANNEL CABLE TRAY
- LOSS OF HEAD TRANSMITTER
- FLOW DIFFERENTIAL PRESSURE TYPE SENSOR AND TRANSMITTER

NOTES THIS SHEET:

- INCLUDED UNDER BID ADDITIVE NO. 1.
- SEE DEMOLITION SHEETS D10 AND D11 FOR ADDITIONAL ELECTRICAL WORK.
- PROVIDE TWO LIMIT SWITCHES, ONE FOR FULLY OPEN AND ONE FOR FULLY CLOSED FOR EACH OF THE ACTUATORS SHOWN.
- SEE DRAWING E002 FOR MCC DETAILS AND NOTES.
- SEE DRAWING E002 FOR CABLE TRAY DETAIL. MOUNT CABLE TRAY AT 10"-0" AFF TO TOP OF CABLE TRAY AND CENTERED BETWEEN EXISTING HVAC DUCTS AND ROW OF LIGHT FIXTURES.
- PROVIDE 3-3" CONDUIT SLEEVES THROUGH WALL AND UP THROUGH FLOOR SLAB TO MCC ROOM ABOVE. APPROXIMATE LOCATION SHOWN, AVOID EXISTING CONDUITS, TO BE REUSED FOR POWER CIRCUITS.
- FILTER CONTROL PANEL A AND B ARE LOCATED ON FLOOR ABOVE. PROVIDE 4" STUB UP THROUGH FLOOR SLAB IN TO EACH CONTROL PANEL PROVIDE 2-#12 CONDUCTORS AND #12 GROUND TO PANEL LP1 FOR EACH CONTROL PANEL. PROVIDE A 15A CIRCUIT BREAKER IN PANEL LP1 FOR EACH CONTROL PANEL. PROVIDE 4" CONDUIT TO CABLE TRAY WITH BUSHINGS FOR TRANSMISSION FROM CONDUIT TO CABLE TRAY.
- PROVIDE 1" GALVANIZED RIGID STEEL CONDUIT FROM CABLE TRAY TO SLUICE GATE (TYP OF 4). ROUTE CONDUIT ALONG SAME PATH AS EXISTING POWER CONDUIT THROUGH FILTERS.
- PROVIDE 3/4" GALVANIZED RIGID STEEL CONDUIT FROM CONTROL PANEL A OR B, AS SHOWN, TO ULTRASONIC LEVEL SENSOR (TYP OF 4). ROUTE CONDUIT SO THAT THERE WILL BE NO OBSTRUCTION AS A RESULT OF THE LOCATION.
- PROVIDE 3/4" GALVANIZED RIGID STEEL CONDUIT FROM CONTROL PANEL A TO ULTRASONIC LEVEL SENSOR. ROUTE CONDUIT SO THAT THERE WILL BE NO OBSTRUCTION AS A RESULT OF THE LOCATION.
- PROVIDE CABLE MANAGEMENT DEVICES FROM CABLE TRAY TO EQUIPMENT BEING POWERED OR CONTROLLED.
- SEE INSTRUMENTATION SHEETS FOR ALL DEVICES AND INSTRUMENTS INCLUDED IN PROJECT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE ALL NECESSARY WIRING AND CONDUIT FOR A COMPLETE SYSTEM.
- PROVIDE CONDUIT AND SIGNAL WIRE FROM FILTER CONTROL PANEL A TO BACKWASH FLOW DIAL INDICATOR LOCATED ON CEILING OF FLOOR ABOVE.

GENERAL DEMOLITION NOTES:

- REMOVE EACH ITEM OF EQUIPMENT, DEVICE, AND FIXTURE INDICATED ON DEMOLITION PLANS AND ITS ASSOCIATED CIRCUITRY BACK TO THE PROTECTIVE DEVICE IN THE PANEL, SWITCHBOARD, OR CONTROLLER, EXCEPT AS OTHERWISE INDICATED.
  - ASSOCIATED CIRCUITRY INCLUDES CONDUIT, CONDUCTORS, BOXES, WIRING DEVICES, COVERPLATES, LAMPS, FIXTURES, WIREWAYS, SWITCHES, STARTERS, ETC., WHICH ARE ASSOCIATED WITH THE ITEM TO BE REMOVED.
  - THE PROTECTIVE DEVICE SHALL REMAIN AS AN INTEGRAL PART OF THE EXISTING PANEL OR SWITCHBOARD, LABEL AS SPARE OR USE FOR NEW CIRCUITS AS INDICATED.
  - WHERE CONDUIT, ASSOCIATED WITH AN ITEM SHOWN TO BE REMOVED IS IN AN INACCESSIBLE AREA, SUCH AS ENCASED IN CONCRETE, ABANDON INACCESSIBLE CONDUIT IN PLACE AND CAP OR SEAL.
  - WHERE SUCH INACCESSIBLE CONDUIT ENDS OR MUST BE TERMINATED IN FINISHED SPACE, REMOVE THE CONDUIT OR BOX TO BELOW THE FINISHED SURFACE OF WALL, CEILING OR FLOOR, FILL VOID WITH NON-SHRINKING GROUT AND FINISH TO MATCH SURROUNDING SURFACES.
- WHERE ONLY A PORTION OF A CIRCUIT'S LOAD IS SCHEDULED TO BE REMOVED, REMOVE ONLY THAT PORTION ASSOCIATED WITH THE DEMOLISHED DEVICE TO A POINT WHERE THE REMAINING LOAD IS ACTIVE AND MAINTAIN IN A GOOD OPERATING CONDITION.
- WHERE AN ITEM OF EQUIPMENT IS SCHEDULED TO BE REMOVED AND RELOCATED, ITS ASSOCIATED CIRCUITRY SHALL ALSO BE REMOVED AS PER GENERAL NOTE 7 ALONG WITH ITS ASSOCIATED SWITCHBOARD, SWITCHES, CONTROLS, AND DEVICES, ETC., AND RELOCATED TO THE LOCATION INDICATED. PROVIDE CONNECTION OF SUCH RELOCATED ITEMS TO NEW CIRCUITRY AS INDICATED.

GENERAL NOTES:

- MOUNTING HEIGHTS, UNLESS OTHERWISE NOTED ARE TO CENTER LINE OF EQUIPMENT.
- PROVIDE DISCONNECT SWITCHES WHERE NOT INDICATED ON EQUIPMENT PER NEC.
- GROUNDING CONDUCTORS ARE NOT INDICATED IN BRANCH CIRCUIT RACEWAYS. PROVIDE GROUND CONDUCTORS AS REQUIRED BY NEC.
- REVISE PANELBOARD SCHEDULES ON AS-BUILT-DRAWING TO REFLECT FINAL INSTALLATION CONDITIONS.
- SEAL PENETRATIONS THRU FLOORS OR FIRE WALLS TO MAINTAIN THE WALLS AND FLOORS FIRE AND ACOUSTIC RATING INTEGRITY.
- PROVIDE ALL STARTERS, CONTACTS, RELAYS, SWITCHES, CONDUIT, CONDUCTORS AND OTHER ACCESSORIES NEEDED FOR A COMPLETE CONTROL SYSTEM OF MOTORS AND PUMPS ASSOCIATED WITH PROCESS AND INSTRUMENTATION DIAGRAM ON SHEET 11.
- WHERE EXTENSION OF AN EXISTING CIRCUIT IS REQUIRED, PROVIDE CONDUIT AND WIRE FROM THE ITEM'S EXISTING LOCATION TO THE LOCATION INDICATED.
- SEE SHEET 11 FOR ROUTING AND COORDINATION WITH INSTRUMENTATION CONTRACTOR. POWER AND INSTRUMENTATION RACEWAYS AND CONDUCTORS BY ELECTRICAL CONTRACTOR.
- FOR ROOMS THAT ARE CORROSIVE OR HAVE SPECIAL REQUIREMENTS REFER TO 2002 NEC AND DETERMINE APPROPRIATE NEMA CLASS AND DIVISION FOR INSTALLATION. PROVIDE MATERIAL AS DETERMINED BY THE ABOVE CODES.
- PROVIDE ALL RACEWAYS AND WIRING NECESSARY FOR A COMPLETE INSTALLATION OF THE PROCESS AND INSTRUMENTATION SYSTEM AS DESCRIBED IN DRAWINGS AND SPECIFICATIONS.

GRAPHIC SCALE



SEALS	CONSULTANT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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ABERT FILTRATION PLANT FILTER REHABILITATION

CITY OF LYNCHBURG, VIRGINIA

PROJECT NUMBER 02067-W

DECEMBER 19, 2003

HAYES, SEAY, MATTERN AND MATTERN, INC.

ARCHITECTS - ENGINEERS - PLANNERS

ROANOKE, VIRGINIA

DRAWING INDEX

SHEET NO.

GENERAL

G1 TITLE SHEET  
G2 ABBREVIATIONS AND LEGENDS

DEMOLITION

D1 BASIN HANDRAIL AND CONCRETE REPAIRS AND PAINTING  
D2 MASONRY REPAIRS  
D3 WINDOWS, CEILING REPAIR & PAINTING, 1st FLOOR  
D4 DOORS, WINDOWS, FLOOR & CEILING REPAIR & PAINTING, 2nd FLOOR  
D5 DOORS, WINDOWS & PAINTING, 3rd FLOOR  
D6 FILTER PIPE GALLERY DEMOLITION AND PAINTING, PLAN  
D7 FILTER PIPE GALLERY DEMOLITION AND PAINTING, SECTIONS  
D8 FILTER SURFACE WASHERS AND PIPING DEMOLITION  
D9 FILTER MEDIA AND EQUIPMENT REPLACEMENT  
D10 LIGHTING REPAIR, 1st FLOOR  
D11 LIGHTING REPAIR, 2nd FLOOR  
D12 ELECTRICAL REFERENCE SHEET  
D13 PLUMBING REPAIRS  
D14 DEHUMIDIFICATION SYSTEM REPAIRS

SHEET NO.

PROCESS

P1 PROCESS PIPING AND ACCESSORIES PLAN  
P2 PROCESS PIPING SECTIONS  
P3 FILTER HOPPER AND TROUGH REPAIR PLANS AND DETAILS  
P4 AIR SCOUR SYSTEM (BID ADDITIVE 1 AND BID ADDITIVE 2)

STRUCTURAL

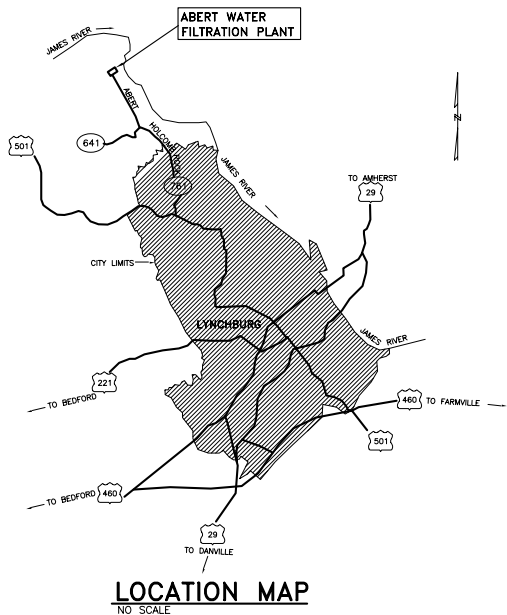
S1 SEDIMENTATION BASINS MODIFICATIONS, NOTES AND DETAILS

ELECTRICAL

E1 LEGEND AND FILTER GALLERY POWER PLAN  
E2 DETAILS AND MOTOR CONTROL CENTER ELEVATION AND SCHEDULE

INSTRUMENTATION

I1 PROCESS AND INSTRUMENTATION DIAGRAM  
I2 FILTER TABLES A&B EXTERIOR AND PANEL LAYOUTS  
I3 CONTROLNET NETWORK LAYOUT AND COMPONENTS  
I4 BLOWER AND PUMP ROOM REMOTE PANEL LAYOUT



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SEALS

CONSULTANT

SYNCHRONY INDUSTRIAL CONTROLS  
ROANOKE, VIRGINIA

BID READY

ABERT FILTRATION PLANT  
FILTER REHABILITATION

CITY OF LYNCHBURG, VIRGINIA

ARCHITECTS ENGINEERS PLANNERS  
HAYES, SEAY, MATTERN & MATTERN, INC.  
1315 FRANKLIN ROAD  
ROANOKE, VA 24016  
(540) 857-3100 WWW.HSM&M.COM

REV	DATE	DESCRIPTION	APP	COMM NO:	60308A
				ISSUE DATE:	DEC. 19, 2003
				DESIGNED BY:	WCH
				DRAWN BY:	REM
				CHECKED BY:	DMH
				SUBMITTED BY:	RFC
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GENERAL

TITLE SHEET

G1

A B B R E V I A T I O N S										L E G E N D S BUILDING MATERIALS									
<p>A AMPERE, AIR, COMPRESSED AIR ASH/TO AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS AB ANCHOR BOLT ABT ABOUT ABV ABOVE AC ALTERNATING CURRENT, AIR CONDITIONING ACI AMERICAN CONCRETE INSTITUTE ACM ASBESTOS CONTAINING MATERIAL ACMU ACROUSTICAL CONCRETE MASONRY UNITS ACS ACCESS ACST ACOUSTIC CEILING TILE A.C.T. ACOUSTIC CEILING TILE AD ALARM CHECK VALVE ADJ ADJACENT ADH ADHESIVE ADM ADMINISTRATIVE AFF ABOVE FINISH FLOOR CWT COUNTERWEIGHT AFMS AIRFLOW MEASURING STATION CULV CULVERT AGGR AIR HANDLING, AIR-HANDLING UNIT AHR ANCHOR AIC AMPERE INTERRUPTING CAPACITY ASC AMERICAN INSTITUTE OF STEEL CONSTRUCTION AL ALUMINUM ALT ALTERNATE AM AMMETER AMP AMPERE ANSI AMERICAN NATIONAL STANDARDS INSTITUTE AP ACCESS PANEL APR APPROVED APPROX APPROXIMATE APS ALARM PRESSURE SWITCH ARCH ARCHITECTURAL AREMA AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION ASB ASBESTOS ASPH ASPHALT ASTM AMERICAN SOCIETY FOR TESTING AND MATERIALS ASTM AMERICAN SOCIETY FOR TESTING AND MATERIALS ATS AUTOMATIC TRANSFER SWITCH AUTO AUTOMATIC AUX AUXILIARY AV AIR VENT, AUDIOVISUAL DISCH DISCHARGE DISC DISCONNECT DISP DISPENSER AMERICAN WIRE GAUGE AMERICAN WELDING SOCIETY AWWA AMERICAN WATER WORKS ASSOCIATION B BATTERY BAL BALANCE B&amp;B BALL &amp; BURLAP B TO B BACK TO BACK BC BOLT CIRCLE, BOTTOM OF CURB BD BOARD BDL BUILDING LINE, BASE LINE BEJ BRICK EXPANSION JOINT BET BETWEEN BF BLIND FLANGE BT BOTTOM BTU BTU BTU/H BTU PER HOUR BU BUILT-UP BUR BUILT-UP ROOF(ING), BURIED BW BOTH WAYS C COURSE, CONVECTOR C&amp;G CENTER TO CENTER CAB CABINET CANTIL CANTILEVER CAP CAPACITY CATV CABLE TELEVISION CB CATCH BASIN, CATCHMENT CCTV CLOSED CIRCUIT TELEVISION CD CEILING DIFFUSER, ROCK CHECK DAM CE CONSTRUCTION ENTRANCE CEM CEMENT CENT. CENTRIFUGAL CF CELLULAR FLOOR CFM CUBIC FEET PER MINUTE CFPS CUBIC FEET PER SECOND CG CORNER GUARD, CHANGE OF GRADE CH CEILING GRILLE CHAM CHAMFER CHBD CHALKBOARD CHEM CHEMICAL CHS CHESSLED CHKR CHECKER, CHECKERED CI CAST IRON CIP CAST IN PLACE, CULVERT INLET PROTECTION CIRC CIRCULAR, CIRCUMFERENCE CKT CIRCUIT CL CEILING CLJ CONTROL JOINT CLO CLOSET CLOS CLOSURE CLPR CALIPER CLR CLEAR CLSD CEILING LINEAR SLOT DIFFUSER CLSR CEILING LINEAR SLOT RETURN CM CENTIMETER CMP CORRUGATED METAL PIPE CMFN COMBINATION CND CONDUIT CNDCT CONDUCTIVE CNDOS CONDENSATE, CONDUITS C.O.G. CHANGE OF GRADE COL COLUMN COMB COMBINATION</p>										<p>COMP COMPRESSION, COMPRESSED CONC CONCRETE COND CONDUCTOR, CONDUCTIVE, CONDENSER CONN CONNECT, CONNECTION CONSTR CONSTRUCTION CONT CONTINUOUS, CONTINUATION CONTR CONTRACT, CONTRACTOR COORD COORDINATE COR CORNER CORR CORRODED, CORRUGATED COVER COVER CP CEMENT PLASTER, CONDENSATE PUMP CPT CARPET CR CEILING REGISTER, HOT CONDENSER WATER CSD CELLULAR STEEL DECK CT CERAMIC TILE, CURRENT TRANSFORMER CTR CENTER CTRL CONTROL CTSK COUNTERSINK CTWT COUNTERWEIGHT CU CUBIC, COPPER CULV CULVERT CV CONVERTER CW DOMESTIC COLD WATER CWB CELLULAR WATER BARRIER D DEPTH, DEGREE OF CURVE, DIMMER DB DRY BUILD, DIRECT BURIAL, DUCT, DEEP DBL DOUBLE DBL DOUBLE DC DIRECT CURRENT DEFL DEFLECT, DEFLECTION DEGR DEGREE DESM DEPRESSURE DEPR DEPRESSURE DEPT DEPARTMENT DET DETAIL</p>									

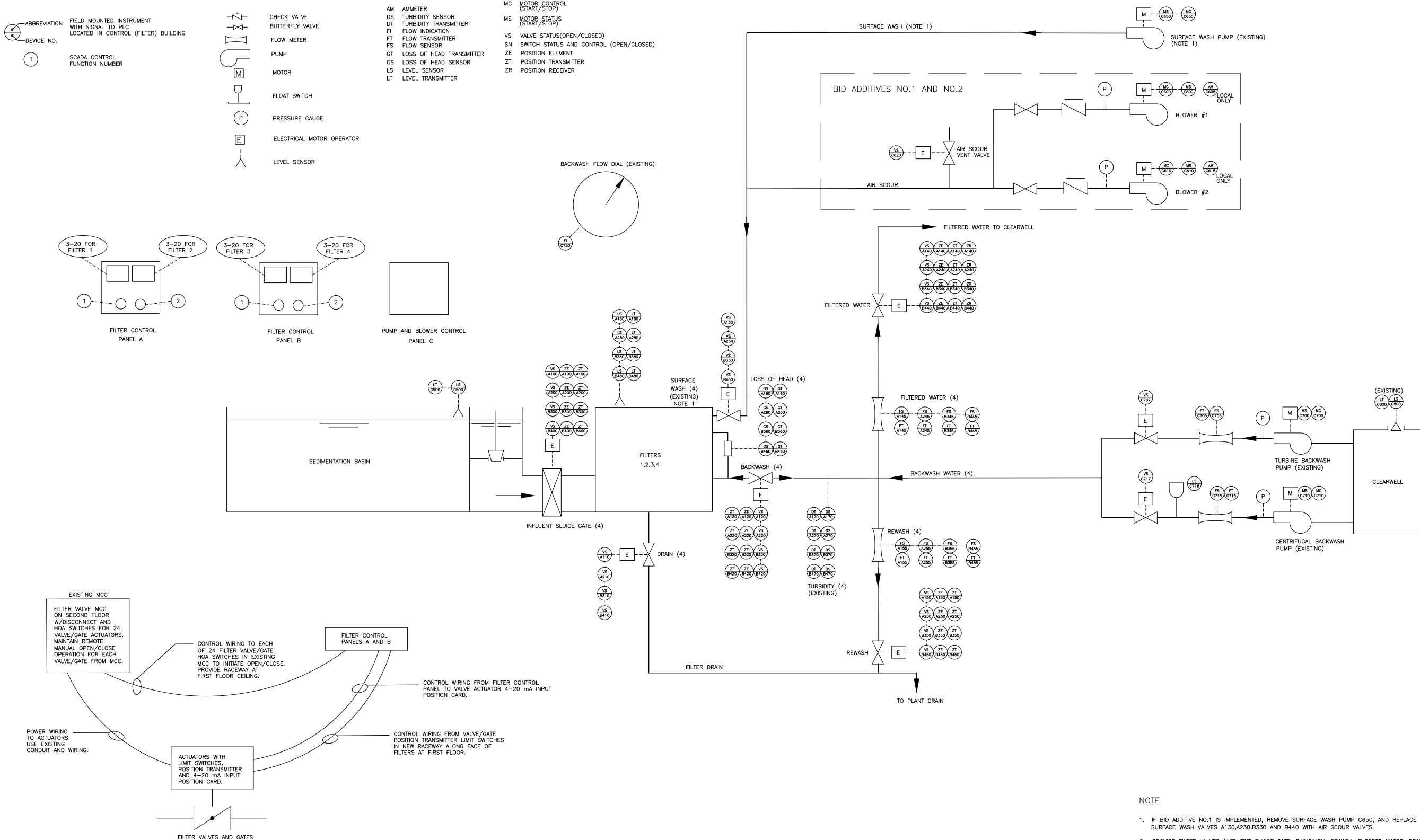
**LEGEND**

ABBREVIATION  
—DEVICE NO.  
1 SCADA CONTROL  
FUNCTION NUMBER

CHECK VALVE  
BUTTERFLY VALVE  
FLOW METER  
PUMP  
MOTOR  
FLOAT SWITCH  
PRESSURE GAUGE  
ELECTRICAL MOTOR OPERATOR  
LEVEL SENSOR

**ABBREVIATIONS**

AM AMMETER  
DS TURBIDITY SENSOR  
DT TURBIDITY TRANSMITTER  
FI FLOW INDICATION  
FT FLOW TRANSMITTER  
FS FLOW SENSOR  
GT LOSS OF HEAD TRANSMITTER  
GS LOSS OF HEAD SENSOR  
LS LEVEL SENSOR  
LT LEVEL TRANSMITTER  
MC MOTOR CONTROL (START/STOP)  
MS MOTOR STATUS (START/STOP)  
VS VALVE STATUS (OPEN/CLOSED)  
SN SWITCH STATUS AND CONTROL (OPEN/CLOSED)  
ZE POSITION ELEMENT  
ZT POSITION TRANSMITTER  
ZR POSITION RECEIVER



**FILTER VALVE AND GATE CONTROL SCHEMATIC**

NO SCALE

**NOTE**

- IF BID ADDITIVE NO.1 IS IMPLEMENTED, REMOVE SURFACE WASH PUMP C650, AND REPLACE SURFACE WASH VALVES A130,A230,B330 AND B440 WITH AIR SCOUR VALVES.
- PROVIDE FILTER VALVES (INFLUENT SLUICE GATE, BACKWASH, REWASH, FILTERED WATER, DRAIN, AND SURFACE WASH/AIR SCOUR) WITH ACTUATORS AND STARTERS. PROVIDE NEW DISCONNECT AND HOA SWITCHES FOR EACH FILTER VALVE IN EXISTING MCC; PROVIDE SIGNAL TO INDICATE HOA SWITCH POSITION TO FILTER CONTROL PANEL A OR B. WHEN NEW HOA SWITCH IS IN HAND POSITION, OPERATION OF EXISTING OPEN/CLOSE SELECTOR SWITCH AT EACH FILTER STARTER SHALL CONTROL VALVE. WHEN NEW HOA SWITCH IS IN AUTO POSITION, PLC SHALL CONTROL VALVE.

SEALS



CONSULTANT

SYNCHRONY INDUSTRIAL CONTROLS  
ROANOKE, VIRGINIA

**BID READY**

**ABERT FILTRATION PLANT  
FILTER REHABILITATION**  
CITY OF LYNCHBURG, VIRGINIA

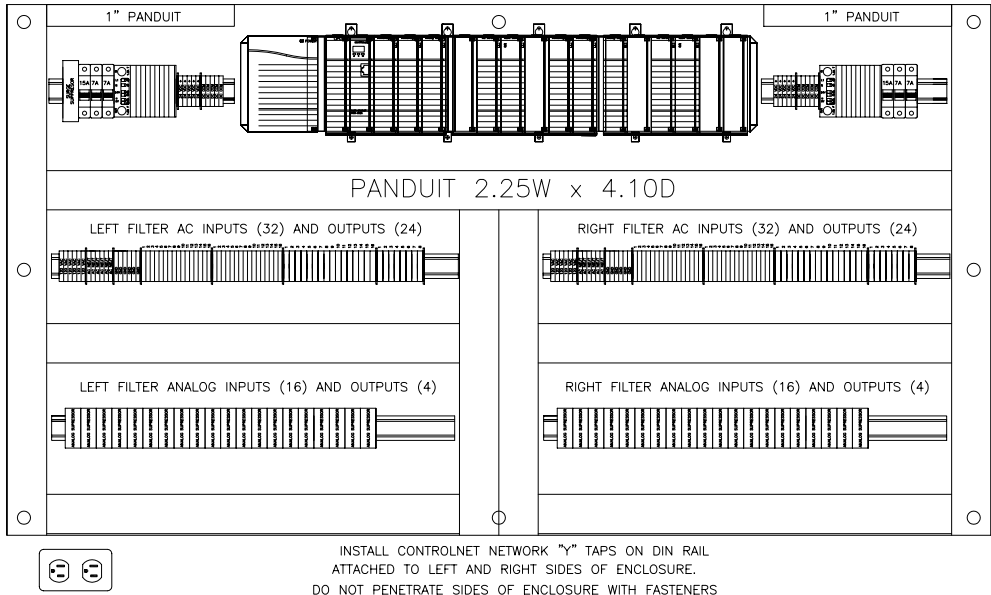
**HSM**  
ARCHITECTS ENGINEERS PLANNERS  
HAYES, SEAY, MATTERN & MATTERN, INC.  
1315 FRANKLIN ROAD  
ROANOKE, VA 24016  
(540) 857-3100 WWW.HSMM.COM

REV	DATE	DESCRIPTION	APP	COMM NO:
				60308A
				ISSUE DATE: DEC. 19, 2003
				DESIGNED BY: RFC
				DRAWN BY: REM
				CHECKED BY: RFC
				SUBMITTED BY: RFC
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INSTRUMENTATION  
PROCESS AND INSTRUMENTATION  
DIAGRAM

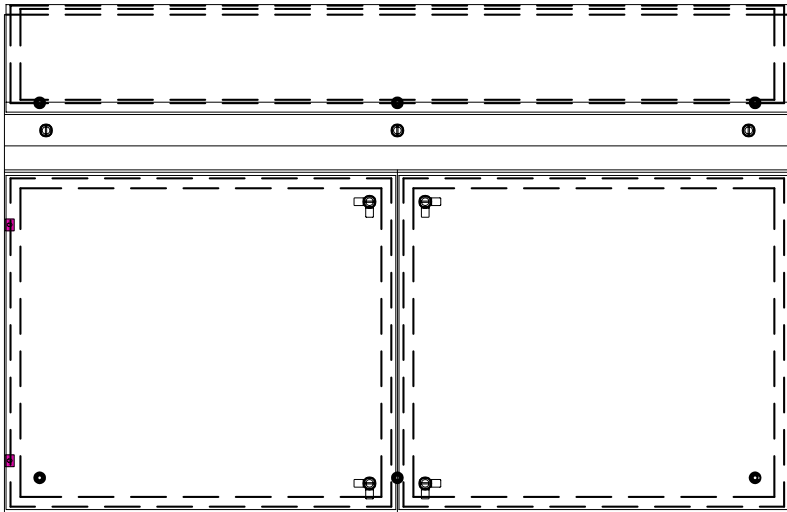
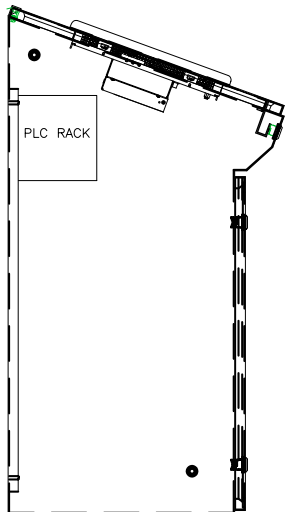
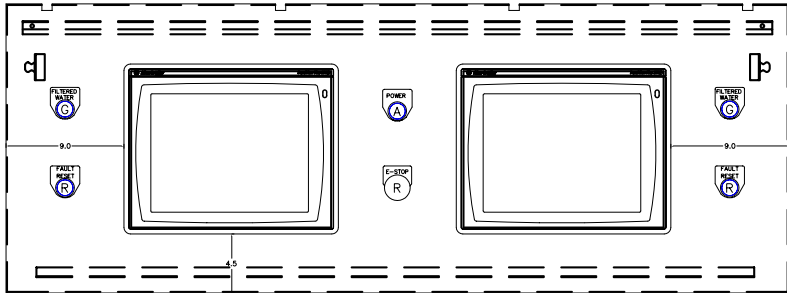
11





FILTER TABLES A&B PANEL LAYOUT

HAMMOND 56.5" W X 30.5"H BACK PANEL



HAMMOND MANUFACTURING #2CSC2060  
NEMA 4X STAINLESS STEEL CONSOLE  
WITH DUEL PANELVIEW PLUS 1500 HMI

FILTER TABLES A&B EXTERIOR LAYOUT DETAILS

Part Number	Description	Manuf.	Min. Qty.	Details
<b>Processor</b>				
1756-L55M13	Logix 5555 Processor w/1.5M Mem	AB	1	1 processor for ever two filters
<b>Racks &amp; Power Supplies</b>				
1756-A17	17 Slot Rack	AB	1	17 Slot Rack
1756-PA72	Rack Power Supply	AB	1	5 vdc @ 10A
<b>I/O Modules &amp; Connectors</b>				
1756-IA16	16 Point 120 VAC Input Module	AB	4	Needs 20 Pin Connector
1756-OA16	16 Point 120 VAC Output Module	AB	2	Needs 20 Pin Connector. Triac Ouputs
1756-IF16	16 Point Analog Input Module	AB	4	Needs 36 Pin Connector.
1756-OF4	4 Point Analog Output Module	AB	2	Needs 20 Pin Connector.
1756-TBNH	20 Pin Connector	AB	8	Required for wiring to I/O module
1756-TBCH	36 Pin Connector	AB	4	Required for wiring to I/O module
1756-N2	Slot Filler	AB	3	Protects unused slots from entry
<b>Operator Interface</b>				
2711P-T15C15B2	PanelView Plus 1500 /C-Net/ColorTouch	AB	2	Operator interface 4 for filters/ 2 for general process control
<b>Filter Control Consoles</b>				
2CSC2060	Hammond SS Console	Hammond	1	Standard 60" wide NEMA 4X
2CWCP60	Hammond Consolelet (Backpanel)	Hammond	1	Standard back panel
TBD	Custom Fabricated side panels	Custom	2	Must be custom designed and fabricated by panel builder
<b>Surge Protection</b>				
TT-2-PE-24DC	4-20 mA analog signal isolator	Phoenix	40	One (1) per analog input and output
DR-120-1	120 VAC 15 A Surge Protection	Transtector	1	Transtector - One for each enclosure
<b>Circuit Breakers</b>				
1492-CB1G150	15 A Single pole	AB	1	Incoming power
1492-CB1G070	<= 7A Single pole	AB	4	Outlets, and 24 VDC power supplies etc.
<b>Power Supplies</b>				
29 42 470	24VDC 2A	Phoenix	2	2 per filter console, 1 per remote enclosure
<b>AC Outlets</b>				
56 00 461	15 amp Duplex Receptacle	Phoenix	1	1 per panel
<b>Terminals</b>				
1492-W4	6mm Terminal blocks	A-B	108	
1492-WG4	6mm Ground Terminal blocks	A-B	12	
1492-CJ6-10	Center Jumper 10 Pole	A-B	10	
1492-PP3	Terminal Block Partition Plate	A-B	26	
1492-EB3	Terminal Block End Barrier	A-B	10	
1492-EA35	Terminal Block End Anchor	A-B	16	
1492-SM6X9H1-50	Terminal Block Markers (1-50)	A-B	16	
<b>Fused Terminals</b>				
1492-WFB4	Fused terminal blocks	A-B	40	
GBM1	1A 5x20mm Fuses	Gould	40	
<b>Din Rail &amp; Wireway</b>				
Din Rail	Standard DIN rail	A-B	1	Lot - Quantity as required
Wireway	Standard Wireway	Panduit	1	Lot - Quantity as required
Cover	Wireway Cover	Panduit	1	Lot - Quantity as required
<b>Push Buttons &amp; Pilot Lights</b>				
800H-FRXTPH16RA1	Push-Pull ILL Red Mush Head E-Stop LED	A-B	1	E-Stop PB
800H-PRH16A	Amber Pilot Light 120VAC LED	A-B	1	Control Power
800H-PRH16G	Green Pilot Light 120VAC LED	A-B	2	Filtered Water
800H-PRAH16R	Red ILL. PB Ext. Head 120VAC LED	A-B	2	Fault Reset
<b>Ringplates, Fasteners &amp; Wire</b>				
Misc		Misc.	6	

FILTER TABLES A&B COMPONENTS

\* EXCLUDING CONTROLNET NETWORK COMPONENTS. CONTRACTOR IS RESPONSIBLE FOR DETERMINING QAUNTITIES REQUIRED FOR WORK.

SEALS	CONSULTANT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							</
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LEGEND

ELECTRICAL ENCLOSURES

COAX NETWORK 1 CABLE

COAX NETWORK 2 CABLE

COAX NETWORK 1 Y TAP

COAX NETWORK 2 Y TAP

COAX NETWORK 1 TERMINATOR RESISTOR

COAX NETWORK 2 TERMINATOR RESISTOR

COAX NETWORK 1 DUMMY NETWORK TERMINATOR

COAX NETWORK 2 DUMMY NETWORK TERMINATOR

NOTE A - INSTALL RG6 COAX (ITEM# 7) AS REQUIRED TO COMPLETE THE NETWORK.

NOTE B - INSTALL RG6 COAX CONNECTOR (ITEM# 10) AT THE END OF EACH COAX SEGMENT AS REQUIRED.

PC1 SUPERVISORS SCADA PC - LAB AREA

PLC PROGRAMMABLE LOGIC CONTROLLER

PV PANELVIEW - COLOR TOUCH SCREEN

RIO REMOTE INPUT OUTPUT RACK

SPT1 SPARE PROGRAMMING TAP - NETWORK 1

SPT2 SPARE PROGRAMMING TAP - NETWORK 2

The diagram illustrates the ControlNet network layout. It features four main components: Filter Control Cabinet "A", Filter Control Cabinet "B", Lab Area SCADA PC, and Blower and Pump Room Cabinet "C".

- Filter Control Cabinet "A"**: Contains a PLC "A" and two PVs. It has a network connection point labeled 5 and two spare programming taps labeled 11 and 12.
- Filter Control Cabinet "B"**: Contains a PLC "B" and two PVs. It has a network connection point labeled 5 and two spare programming taps labeled 11 and 12.
- Lab Area SCADA PC**: Contains a PC1 and a programming tap. It has a network connection point labeled 6 and two spare programming taps labeled 11 and 12.
- Blower and Pump Room Cabinet "C"**: Contains a RIO RACK. It has a network connection point labeled 5 and two spare programming taps labeled 11 and 12. It also has a network connection point labeled 7 and two spare programming taps labeled 11 and 12.

The network is connected via a central bus line. The connections are as follows:

- Filter Control Cabinet "A" is connected to the central bus via a network connection point labeled 5.
- Filter Control Cabinet "B" is connected to the central bus via a network connection point labeled 5.
- Lab Area SCADA PC is connected to the central bus via a network connection point labeled 6.
- Blower and Pump Room Cabinet "C" is connected to the central bus via a network connection point labeled 5.

CONTROLNET NETWORK LAYOUT

Part #	Description	Manuf.	Qty.	Details
ControlNet Coax Network				
1756-CNBR	ControlNet Module	AB	3	Two filter tables and one remote panel
1784-PCIC	ControlNet PCI Bus Interface	AB	1	For SCADA PC
1786-RG6	Coax Cable (non hi-flex)	AB	1 lot	Cable for entire network - quantity as required
1786-CTK	Network Toolkit	AB	1	All tools necessary for network installation and repair
1786-XT	Network Terminator	AB	4	Terminate each end of the network
1786-BCN	RG6 Cable Coaxial Connector	AB	1 Lot	Quantity as required
1786-TPYS	Y-Tap for ControlNet Coax Cable	AB	18	Straight "Y" tap (one needed for each drop)
1786-TCAP	Dummy Network Terminator	AB	2	For terminating programming drop on the network
1756-CP3	Programming Cable	AB	2	Serial Cable - 3 meters. PC and spare drop

CONTROLNET NETWORK COMPONENTS

\* EXCLUDING CONTROLNET NETWORK COMPONENTS. CONTRACTOR IS RESPONSIBLE FOR DETERMINING QAUNTITIES REQUIRED FOR WORK.

SEALS

CONSULTANT

BID READY

ABERT FILTRATION PLANT  
FILTER REHABILITATION  
  
CITY OF LYNCHBURG, VIRGINIA

SYNCHRONY

INDUSTRIAL CONTROLS  
6410 COMMONWEALTH DRIVE  
ROANOKE, VA 24018  
(540) 989-1541 WWW.SYNCHRONY.COM

REV	DATE	DESCRIPTION	APP

COMM NO: 60308A

ISSUE DATE: DEC. 19, 2003

DESIGNED BY: SYNCHRONY

DRAWN BY: SYNCHRONY/KAJ

CHECKED BY: SYNCHRONY

SUBMITTED BY: RFC

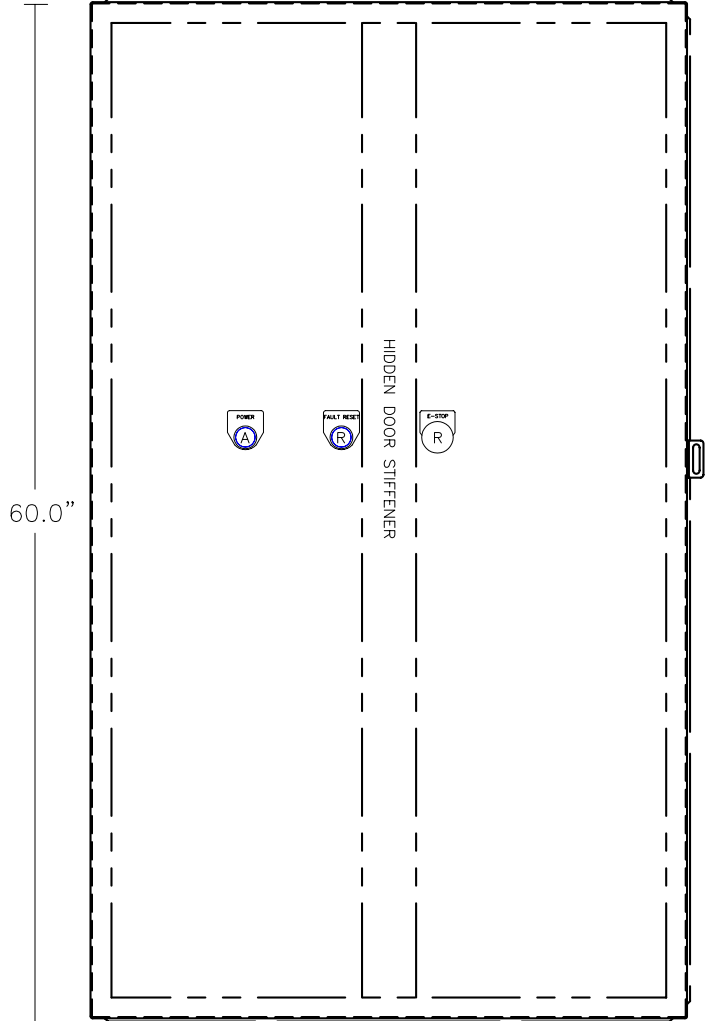
INSTRUMENTATION

CONTROLNET NETWORK  
LAYOUT AND COMPONENTS

13

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HOFFMAN A-60H36CLP ENCLOSURE

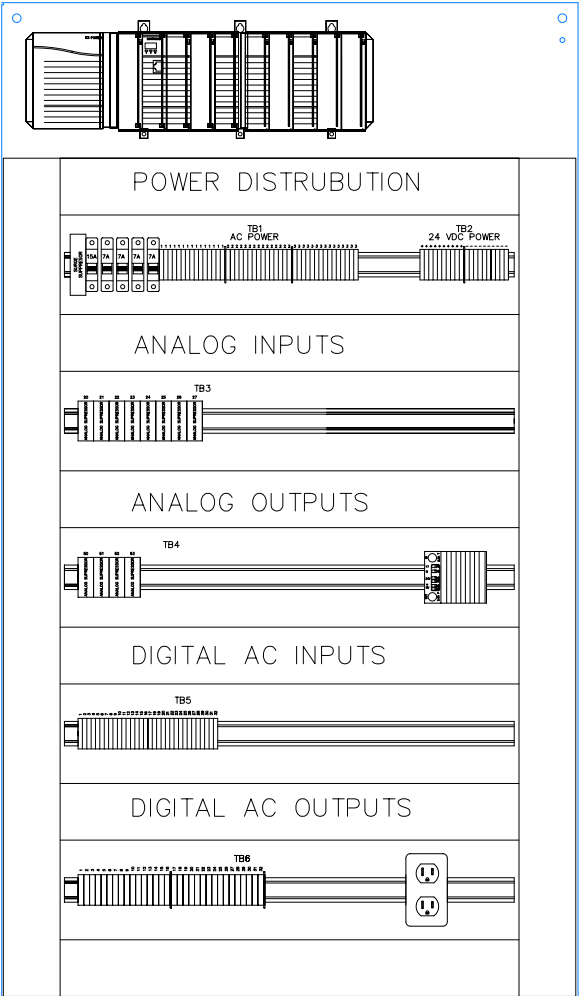


36.0"

DEPTH = 10.0"

BLOWER AND PUMP ROOM  
REMOTE PANEL EXTERIOR LAYOUT

3" X 3" PANDUIT USED THROUGHOUT



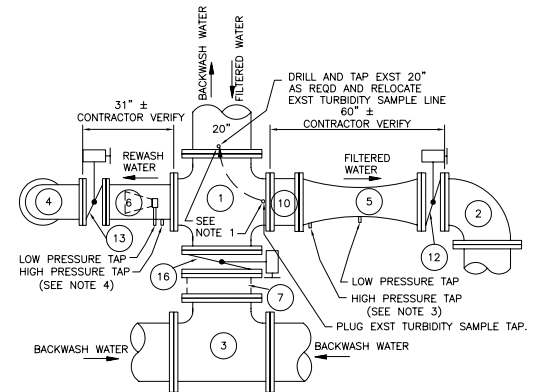
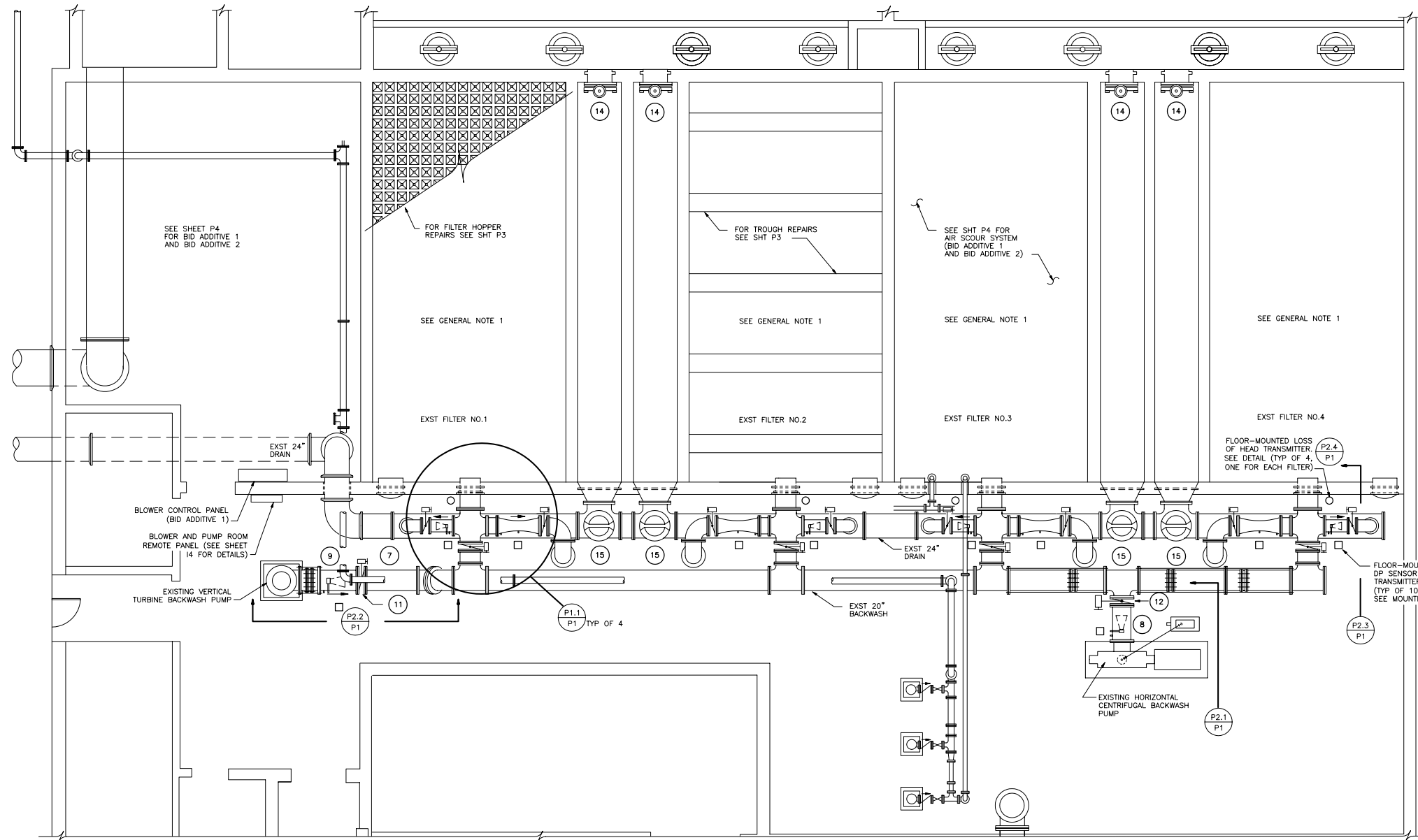
BLOWER AND PUMP ROOM  
REMOTE PANEL INTERIOR LAYOUT

Part Number	Description	Manuf.	Min. Qty.	Details
<b>Racks &amp; Power Supplies</b>				
1756-A10	10 Slot Rack	AB	1	10 Slot Rack
1756-PA72	Rack Power Supply	AB	1	5 vdc @ 10A
<b>I/O Modules &amp; Connectors</b>				
1756-IA16	16 Point 120 VAC Input Module	AB	1	Needs 20 Pin Connector
1756-OA16	16 Point 120 VAC Output Module	AB	1	Needs 20 Pin Connector. Triac Outputs
1756-IF16	16 Point Analog Input Module	AB	1	Needs 36 Pin Connector.
1756-OF4	4 Point Analog Output Module	AB	1	Needs 20 Pin Connector.
1756-TBNH	20 Pin Connector	AB	3	Required for wiring to I/O module
1756-TBCH	36 Pin Connector	AB	1	Required for wiring to I/O module
1756-N2	Slot Filler	AB	5	Protects unused slots from entry
<b>Remote Enclosures</b>				
A-60H36CLP	Nema 4 60H x 36W x 10D Enclosure	Hoffman	1	Standard enclosure
A-60P36	Back Panel	Hoffman	1	Standard back panel
<b>Surge Protection</b>				
TT-2-PE-24DC	4-20 mA analog signal isolator	Phoenix	20	One (1) per analog input and output
DR-120-1	120 VAC 15 A Surge Protection	Transtector	1	Transtector - One for each enclosure
<b>Circuit Breakers</b>				
1492-CB1G150	15 A Single pole	AB	1	Incoming power
1492-CB1G070	<= 7A Single pole	AB	4	Outlets, and 24 VDC power supplies etc.
<b>Power Supplies</b>				
29 42 470	24VDC 2A	Phoenix	1	2 per filter console, 1 per remote enclosure
<b>AC Outlets</b>				
56 00 461	15 amp Duplex Receptacle	Phoenix	1	1 per panel
<b>Terminals</b>				
1492-W4	6mm Terminal blocks	A-B	82	
1492-WG4	6mm Ground Terminal blocks	A-B	15	
1492-CJ6-10	Center Jumper 10 Pole	A-B	5	
1492-PP3	Terminal Block Partition Plate	A-B	14	
1492-EB3	Terminal Block End Barrier	A-B	10	
1492-EA35	Terminal Block End Anchor	A-B	14	
1492-SM6X9H1-50	Terminal Block Markers (1-50)	A-B	14	
<b>Fused Terminals</b>				
1492-WFB4	Fused terminal blocks	A-B	32	
GBM1	1A 5x20mm Fuses	Gould	32	
<b>Din Rail &amp; Wireway</b>				
Din Rail	Standard DIN rail	A-B	1	Lot - Quantity as required
Wireway	Standard Wireway	Panduit	1	Lot - Quantity as required
Cover	Wireway Cover	Panduit	1	Lot - Quantity as required
<b>Push Buttons &amp; Pilot Lights</b>				
800H-FRXTPH16RA1	Push-Pull ILL Red Mush Head E-Stop LED	A-B	1	E-Stop PB
800H-PRH16A	Amber Pilot Light 120VAC LED	A-B	1	Control Power
800H-PRAH16R	Red ILL. PB Ext. Head 120VAC LED	A-B	1	Fault Reset
<b>Ringplates, Fasteners &amp; Wire</b>				
Misc		Misc.	3	

BLOWER AND PUMP ROOM REMOTE PANEL COMPONENTS

\* EXCLUDING CONTROLNET NETWORK COMPONENTS. CONTRACTOR RESPONSIBLE FOR DETERMINING QUAINTITIES REQUIRED FOR WORK.

SEALS	CONSULTANT	BID READY	ABERT FILTRATION PLANT FILTER REHABILITATION  CITY OF LYNCHBURG, VIRGINIA	<div>SYNCHRONY</div> <div>INDUSTRIAL CONTROLS 6410 COMMONWEALTH DRIVE ROANOKE, VA 24018 (540) 989-1541    WWW.SYNCHRONY.COM</div>	<table><tr><th>REV</th><th>DATE</th><th>DESCRIPTION</th><th>APP</th></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr></table>	REV	DATE	DESCRIPTION	APP																													<table><tr><td>COMM NO: 60308A</td></tr><tr><td>ISSUE DATE: DEC. 19, 2003</td></tr><tr><td>DESIGNED BY: SYNCHRONY</td></tr><tr><td>DRAWN BY: SYNCHRONY/KAJ</td></tr><tr><td>CHECKED BY: SYNCHRONY</td></tr><tr><td>SUBMITTED BY: RFC</td></tr></table>	COMM NO: 60308A	ISSUE DATE: DEC. 19, 2003	DESIGNED BY: SYNCHRONY	DRAWN BY: SYNCHRONY/KAJ	CHECKED BY: SYNCHRONY	SUBMITTED BY: RFC	INSTRUMENTATION  BLOWER AND PUMP ROOM REMOTE PANEL LAYOUT	14
REV	DATE	DESCRIPTION	APP																																											
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SUBMITTED BY: RFC																																														



- NOTES:
1. PROVIDE BRONZE CORP. STOP AND COUPLING AT PIPE TAP FOR SAMPLE LINE CONNECTION. EXTEND NEW SAMPLE LINE WITH TYGON TUBING, SIZE TO MATCH EXISTING, LENGTH AS REQUIRED. CONNECT NEW SAMPLE LINE TO EXST SAMPLE LINE WITH HDPE OR POLYPROPYLENE TUBE CONNECTOR, SIZE AS REQUIRED.
  2. PIPING, VALVES AND METERS SHOWN ARE FOR FILTERS 1 AND 3. FILTERS 2 AND 4 ARE SIMILAR (MIRROR IMAGE).
  3. LOCATE DP SENSOR AND TRANSMITTER ADJACENT TO VENTURI METER, SEE MOUNTING DETAIL P2.7/P1, PROVIDE LOW AND HIGH PRESSURE TUBES FROM VENTURI METER TO INSTRUMENT.
  4. LOCATE DP SENSOR AND TRANSMITTER ADJACENT TO V-CONE METER, SEE MOUNTING DETAIL P2.7/P1, PROVIDE LOW AND HIGH PRESSURE TUBES FROM V-CONE METER TO INSTRUMENT.
  5. FILTER VALVE PIPING ARRANGEMENT FOR FILTERS 1 AND 3 ARE AS INDICATED ABOVE, FILTER VALVE PIPING ARRANGEMENT FOR FILTERS 2 AND 4 ARE MIRROR IMAGES OF THAT SHOWN ABOVE.

**ENLARGED PLAN**  
SCALE: 1/2" = 1'

**GENERAL NOTES**

1. PROVIDE AND INSTALL NEW FILTER MEDIA AND SUPPORT GRAVEL AS INDICATED IN THE CROSS-SECTION THROUGH FILTER MEDIA SHOWN ON SHEET P2.
2. SEE SHEET P3 FOR LOCATION OF FILTER LEVEL TRANSMITTERS (TYP OF 4).

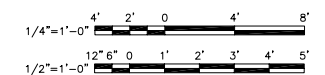
**PLAN - PROCESS PIPING AND ACCESSORIES**  
SCALE: 1/4"=1'-0"

VALVE AND FITTING SCHEDULE		
KEY	SIZE AND DESCRIPTION	NOTES
①	EXST 20" X 16" CROSS, FLG X FLG	
②	EXST 16" 90° BEND, FLG X FLG	
③	EXST 20" TEE, FLG X FLG	
④	EXST 10" 90° BEND, FLG X FLG	
⑤	16" VENTURI METER, FLG X FLG	
⑥	10" V-CONE METER, WITH 10" FLG X 16" FLG	ADJUST LENGTH AS REQUIRED TO FIT SPACE *
⑦	20" SPOOL, FLG X FLG	LENGTH AS REQUIRED
⑧	16" V-CONE METER, FLG X FLG	ADJUST LENGTH AS REQUIRED TO FIT SPACE *
⑨	20" V-CONE METER, FLG X FLG	

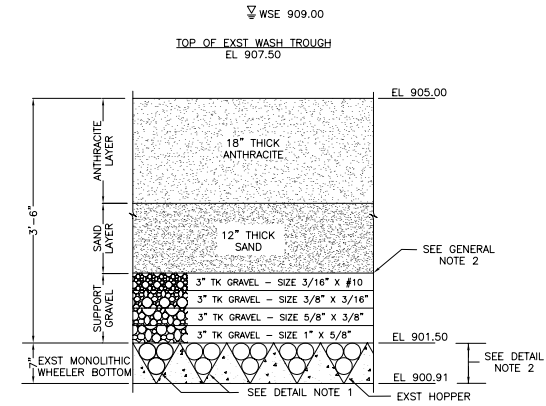
\* ADJUSTMENT MADE BY MANUFACTURER; CONTRACTOR CONFIRM REQUIRED DIMENSIONS.

VALVE AND FITTING SCHEDULE		
KEY	SIZE AND DESCRIPTION	NOTES
⑩	16" SPOOL PIECE, FLG X FLG	LENGTH AS REQUIRED
⑪	20" BUTTERFLY VALVE W/ ELECTRIC ACTUATOR, FLG X FLG	TURBINE BACKWASH PUMP VALVE
⑫	16" BUTTERFLY VALVE W/ ELECTRIC ACTUATOR, FLG X FLG	FILTERED WATER OR CENTIFUGAL BACKWASH PUMP VALVE
⑬	10" BUTTERFLY VALVE W/ ELECTRIC ACTUATOR, FLG X FLG	REWASH VALVE
⑭	24" X 36" SLUICE GATE	INFLUENT SLUICE GATE (REUSE EXST ELECTRIC ACTUATOR, OPERATOR STAND AND WALL THIMBLE)
⑮	FURNISH AND INSTALL NEW ELECTRIC ACTUATOR ON EXST 20" DRAIN VALVE	REUSE EXST DRAIN VALVE
⑯	20" BUTTERFLY VALVE W/ ELECTRIC ACTUATOR	BACKWASH VALVE

**GRAPHIC SCALES**



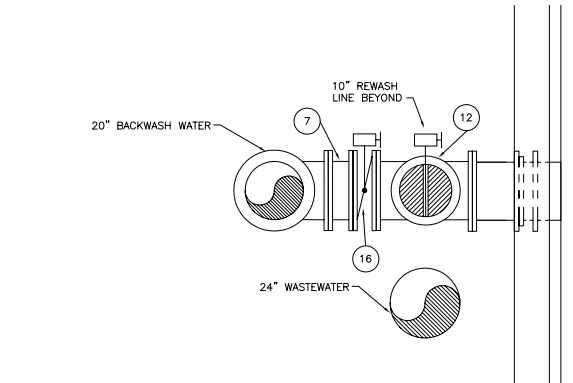
SEALS 	CONSULTANT	<b>BID READY</b>	<b>ABERT FILTRATION PLANT FILTER REHABILITATION</b>  CITY OF LYNCHBURG, VIRGINIA	<b>HSMM</b> ARCHITECTS ENGINEERS PLANNERS HAYES, SEAY, MATTERN & MATTERN, INC. 1315 FRANKLIN ROAD ROANOKE, VA 24016 (540) 857-3100 WWW.HSMM.COM	REV    DATE    DESCRIPTION    APP	COMM NO: 60308A ISSUE DATE: DEC. 19, 2003 DESIGNED BY: WCH DRAWN BY: REM CHECKED BY: DMH SUBMITTED BY: RFC	PROCESS	<b>P1</b>
					PROCESS PIPING AND ACCESSORIES PLAN			



- DETAIL NOTES:
1. REUSE EXST PORCELAIN SPHERES WHERE APPLICABLE AND REPLACE SPHERES WHERE REQUIRED. SEE PORCELAIN SPHERE PLACEMENT DETAIL ON SHEET P3.
  2. PLACE FILL GRAVEL FLUSH WITH TOP OF HOPPER AFTER INSTALLATION OF SPHERES.

### CROSS-SECTION THROUGH FILTER MEDIA

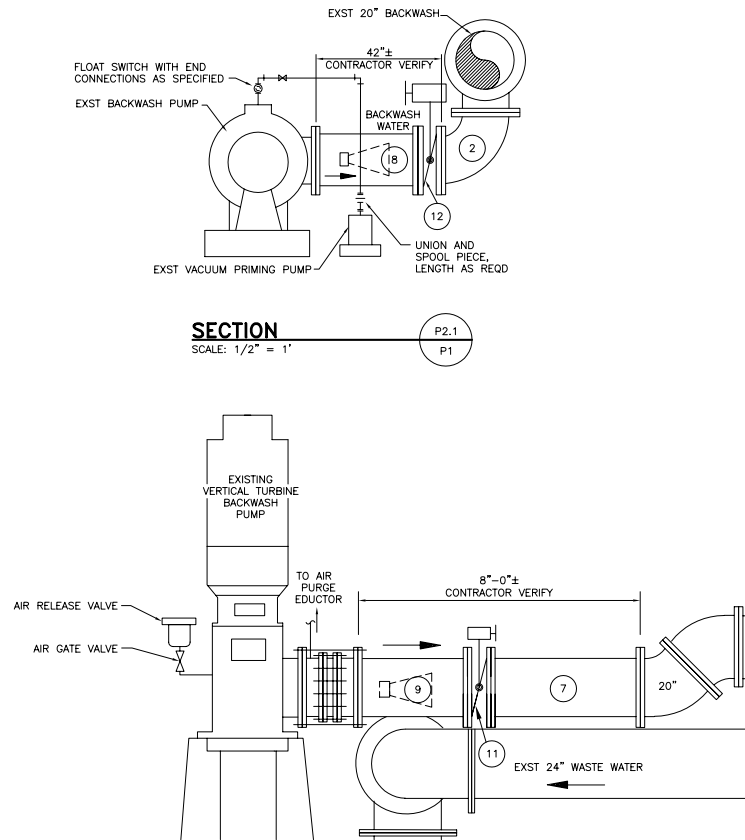
NOT TO SCALE



### SECTION

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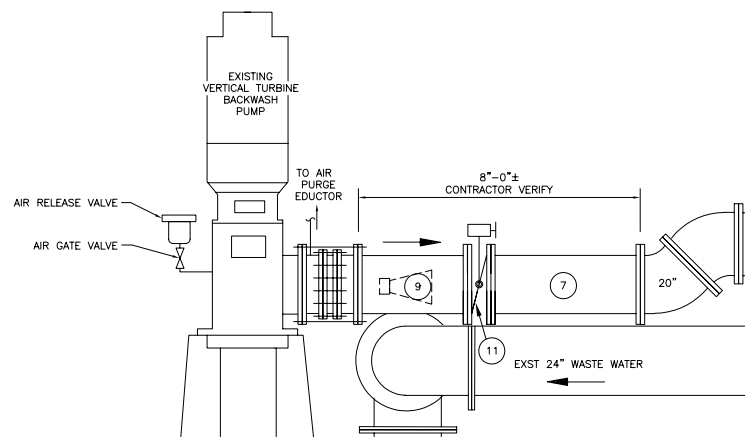
P2.3  
P1



### SECTION

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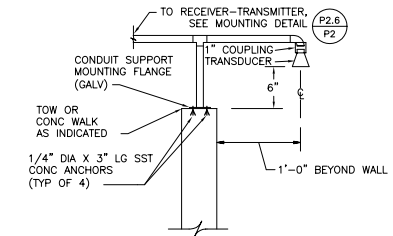
P2.1  
P1



### SECTION

SCALE: 1/2" = 1'

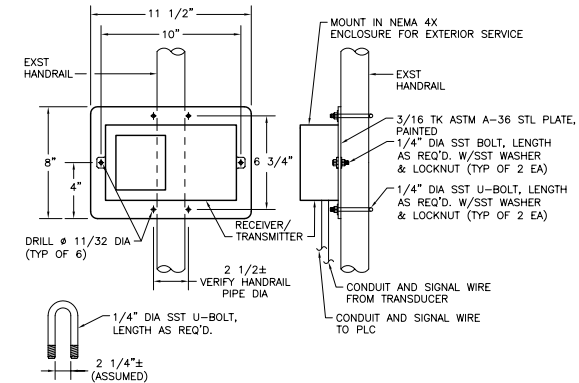
P2.2  
P1



### ULTRASONIC LEVEL SENSOR TRANSDUCER MOUNTING DETAIL

NOT TO SCALE

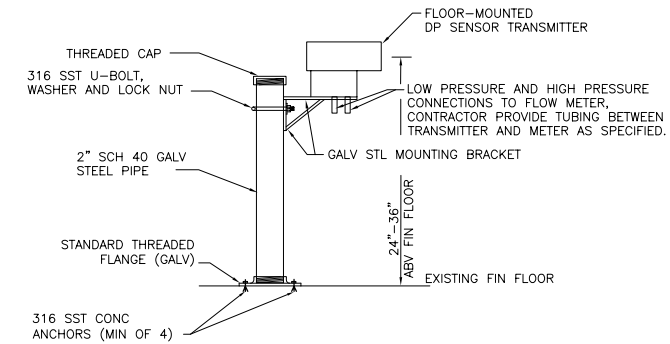
P2.5  
P3



### ULTRASONIC LEVEL SENSOR RECEIVER/TRANSMITTER MOUNTING DETAIL

NOT TO SCALE

P2.6  
P2

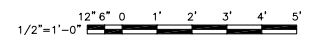


### FLOW DIFFERENTIAL PRESSURE TRANSMITTER MOUNTING DETAIL

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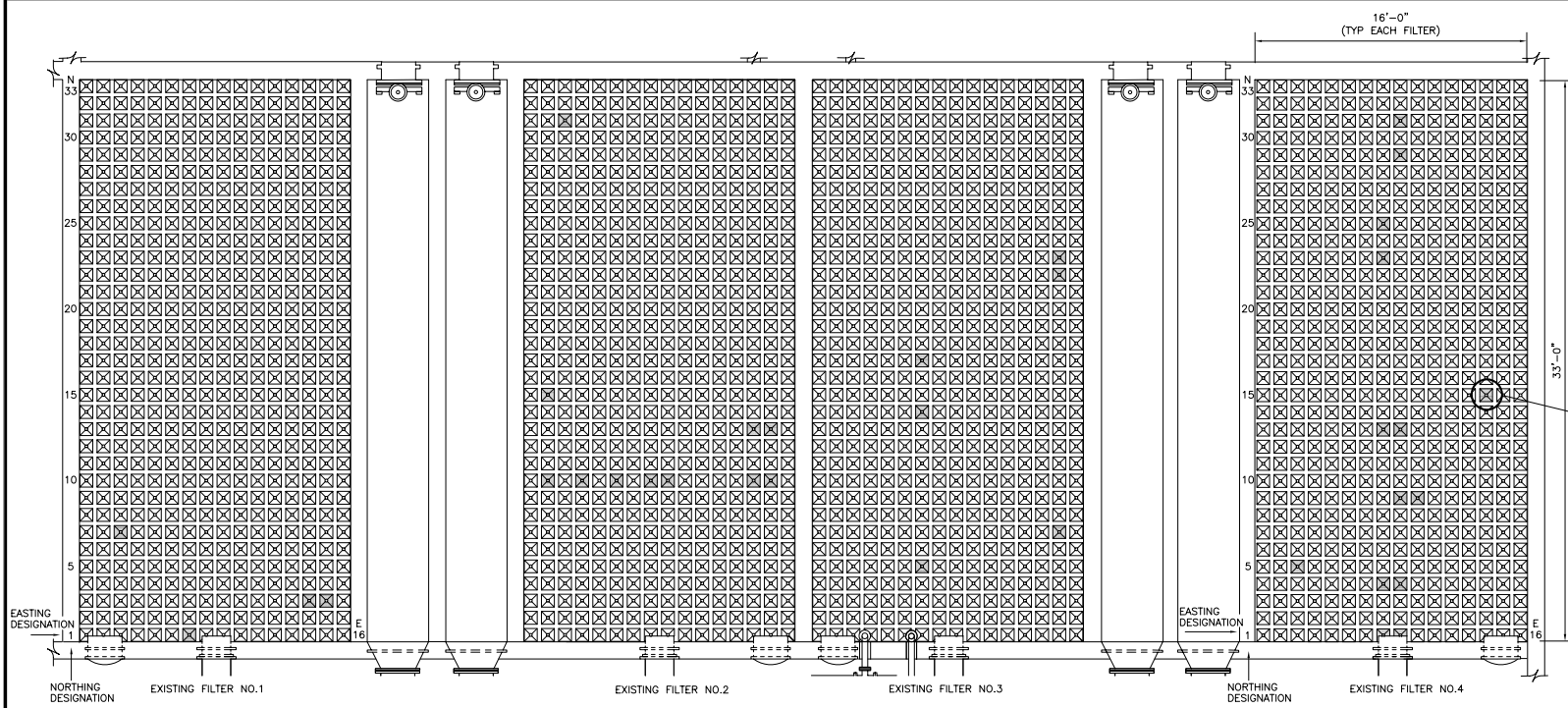
P2.7  
P2

### GRAPHIC SCALES

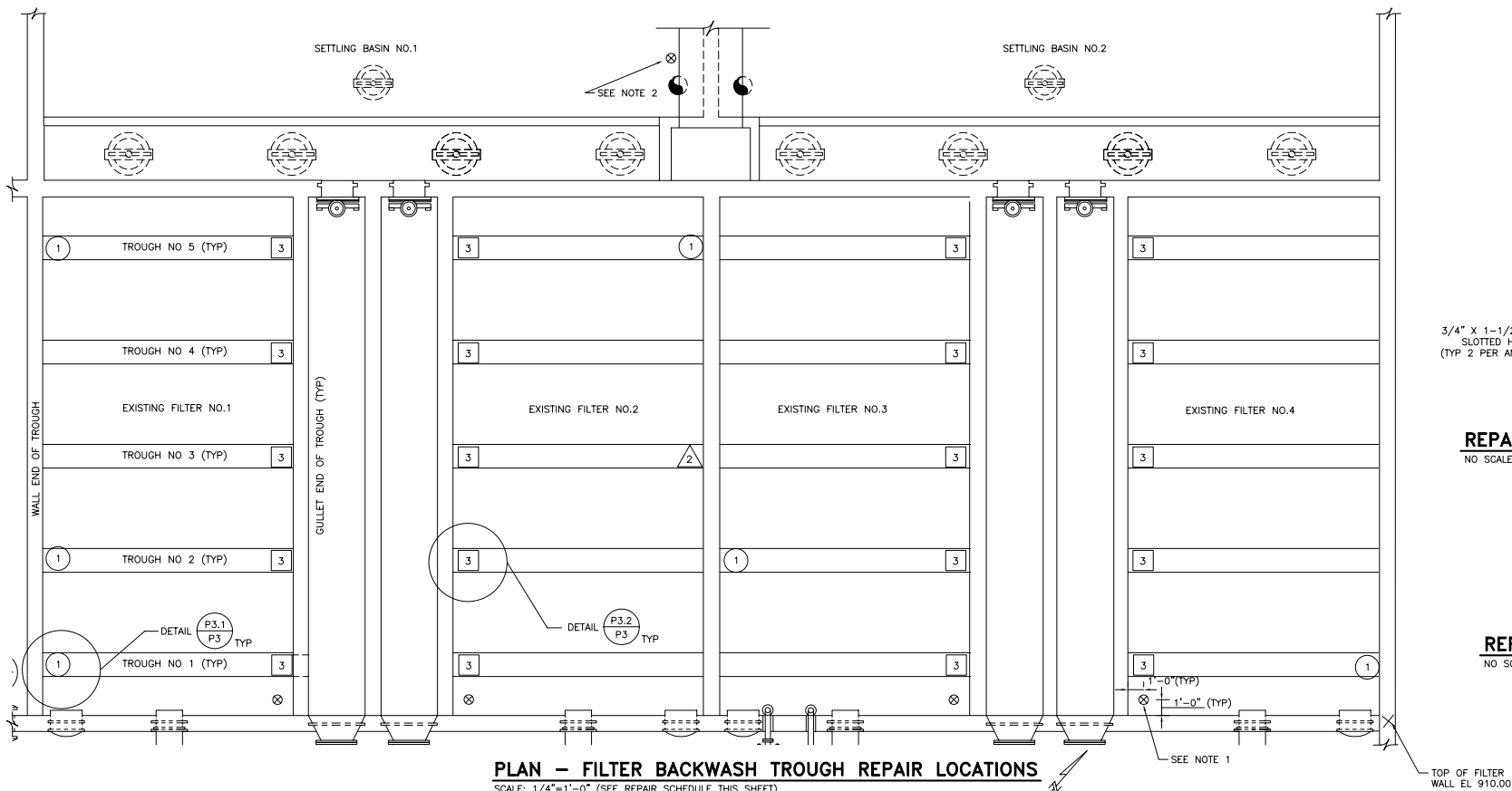


SEALS	CONSULTANT	BID READY	ABERT FILTRATION PLANT FILTER REHABILITATION CITY OF LYNCHBURG, VIRGINIA	<div> <div> <b>HSMM</b>  ARCHITECTS ENGINEERS PLANNERS  HAYES, SEAY, MATTERN &amp; MATTERN, INC.  1315 FRANKLIN ROAD  ROANOKE, VA 24016  (540) 857-3100 WWW.HSMM.COM </div> <table> <tr> <th>REV</th><th>DATE</th><th>DESCRIPTION</th><th>APP</th><th>COMM NO:</th></tr> <tr> <td></td><td></td><td></td><td></td><td>60308A</td></tr> <tr> <td></td><td></td><td></td><td></td><td>ISSUE DATE: DEC. 19, 2003</td></tr> <tr> <td></td><td></td><td></td><td></td><td>DESIGNED BY: REM/WCH</td></tr> <tr> <td></td><td></td><td></td><td></td><td>DRAWN BY: REM</td></tr> <tr> <td></td><td></td><td></td><td></td><td>CHECKED BY: DMH</td></tr> <tr> <td></td><td></td><td></td><td></td><td>SUBMITTED BY: RFC</td></tr> <tr> <td></td><td></td><td></td><td></td><td>© HAYES, SEAY, MATTERN &amp; MATTERN, INC., 2003. ALL RIGHTS RESERVED.</td></tr> </table> </div> <td> <div> <div>PROCESS</div> <div>PROCESS PIPING SECTIONS</div> </div> </td> <td>P2</td>	REV	DATE	DESCRIPTION	APP	COMM NO:					60308A					ISSUE DATE: DEC. 19, 2003					DESIGNED BY: REM/WCH					DRAWN BY: REM					CHECKED BY: DMH					SUBMITTED BY: RFC					© HAYES, SEAY, MATTERN & MATTERN, INC., 2003. ALL RIGHTS RESERVED.	<div> <div>PROCESS</div> <div>PROCESS PIPING SECTIONS</div> </div>	P2
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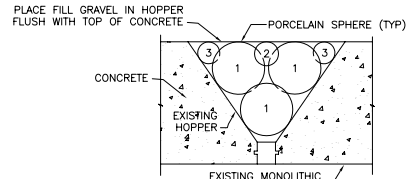


PLAN - FILTER HOPPER REPAIR LOCATIONS  
SCALE: 1/4"=1'-0"

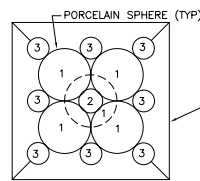


PLAN - FILTER BACKWASH TROUGH REPAIR LOCATIONS  
SCALE: 1/4"=1'-0" (SEE REPAIR SCHEDULE THIS SHEET)

- NOTES:
1. MOUNT ULTRASONIC LEVEL SENSOR (TYP. OF 4) TO TOP OF FILTER WALL AT SECOND FLOOR. POSITION SENSOR CONE ABOVE WATER SURFACE TO AVOID INTERFERENCE WITH FILTER SIDE WALLS. SEE MOUNTING DETAIL P2.5/P3.
  2. MOUNT ULTRASONIC LEVEL SENSOR TO TOP OF CONCRETE WALK AT SETTLING BASIN NO. 1. SEE MOUNTING DETAIL P2.5/P3.



SECTION VIEW



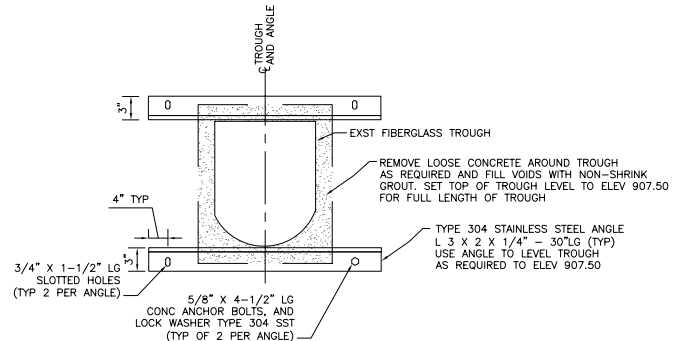
PLAN VIEW

SCHEDULE OF PORCELAIN SPHERES PER HOPPER		
SPHERE NO.	SPHERE SIZE	NUMBER OF SPHERES
1	3" DIAMETER	5
2	1-3/8" DIAMETER	8
3	1-1/4" DIAMETER	

PORCELAIN SPHERES PLACEMENT DETAIL  
NOT TO SCALE

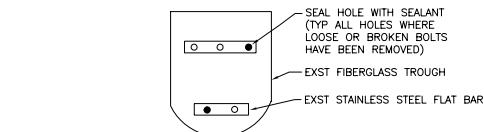
NOTES FOR PORCELAIN SPHERES

1. EXISTING PORCELAIN SPHERES SHALL REMAIN IN FILTER HOPPERS THAT ARE NOT INDICATED TO BE REPAIRED.
2. EXISTING PORCELAIN SPHERES SHALL BE REMOVED FROM FILTER HOPPERS THAT ARE TO BE REPAIRED. AFTER THE FILTER HOPPERS ARE REPAIRED, EXISTING PORCELAIN SPHERES, THAT ARE UNDAMAGED, MAY BE REUSED. ALL DAMAGED PORCELAIN SPHERES SHALL BE REPLACED WITH NEW SPHERES.



REPAIR DETAIL - GULLET END OF TROUGH  
NO SCALE

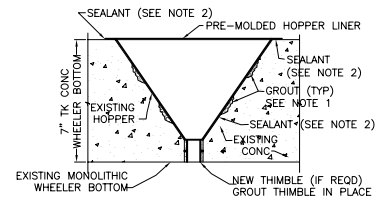
P3.2  
P3



REPAIR DETAIL - WALL END OF TROUGH  
NO SCALE

P3.1  
P3

GRAPHIC SCALES



NOTES FOR HOPPER REPAIR

1. REMOVE SPALLING CONCRETE (WHERE REQUIRED) AND THOROUGHLY CLEAN HOPPER WITH WIRE BRUSH AND VACUUM. FILL VOIDS WITH GROUT TO FORM A SMOOTH SURFACE.
2. PROVIDE SEALANT CONFORMING TO NSF 61. APPLY SEALANT ON ALL FOUR SIDES OF HOPPER LINER, BENEATH LINER FLANGE ALL AROUND AND A BEAD AROUND JOINT BETWEEN LINER FLANGE AND EXST CONCRETE. BEAD SHALL BE CONTINUOUS TO FORM A TIGHT SEAL.

FILTER HOPPER REPAIR DETAIL  
NOT TO SCALE

HOPPER REPAIR LOCATION SCHEDULE (1)		
FILTER NO.	EASTING	NORTHING
1	3	7
	7	1
	14	3
	15	3
	2	10
2	2	15
	3	31
	4	10
	6	10
	8	10
	9	10
	14	10
	14	13
	15	10
	15	13
3	7	5
	7	14
	7	17
	15	7
	15	22
4	15	23
	3	5
	8	1
	8	4
	8	13
	8	23
	8	25
	9	1
	9	4
	9	9
	9	13
	9	29
	9	31
	10	9
	14	15

(1) EACH FILTER HAS 528 HOPPERS. THERE ARE 16 HOPPERS IN THE EASTING DIRECTION AND 33 HOPPERS IN THE NORTHING DIRECTION FORMING A GRID OF 528 HOPPERS PER FILTER. LOCATION OF HOPPERS TO BE REPAIRED ARE BASED ON THIS GRID SYSTEM.

FILTER BACKWASH TROUGH REPAIR SCHEDULE		
TROUGH LOCATION	REPAIR WORK	SYMBOL AND NUMBER
FILTER 1, WALL END OF TROUGHS 1,2 AND 5	REMOVE LOOSE AND BROKEN BOLTS, CLEAN HOLES AND SEAL WITH NSF 61-CERTIFIED SEALANT. COMPLETELY FILL BOLT HOLE WITH SEALANT TO REFUSAL AND SMOOTH FLUSH WITH STAINLESS STEEL FLAT BAR.	①
FILTER 2, WALL END OF TROUGH 5		①
FILTER 3, WALL END OF TROUGH 2		①
FILTER 4, WALL END OF TROUGH 1		①
FILTER 2, WALL END OF TROUGH 3	SEAL HOLES IN END OF FIBERGLASS TROUGH WITH NSF 61-CERTIFIED SEALANT. COMPLETELY FILL HOLE WITH SEALANT TO REFUSAL AND SMOOTH FLUSH WITH TROUGH END WALL.	△
FILTER 1 THRU 4, TROUGHS 1 THRU 5, GULLET END	REMOVE LOOSE CONCRETE FROM AROUND THE END OF THE TROUGH AND FILL VOIDS WITH GROUT FLUSH WITH ADJACENT CONCRETE WALL. INSTALL ANGLE SUPPORTS ABOVE AND BELOW TROUGH AS DETAILED.	③

NOTE: LEVEL ALL TROUGHS TO ELEVATION 907.50 BY ADJUSTING GULLET END OF TROUGH.



CONSULTANT

BID READY

ABERT FILTRATION PLANT  
FILTER REHABILITATION

CITY OF LYNCHBURG, VIRGINIA

HSMM

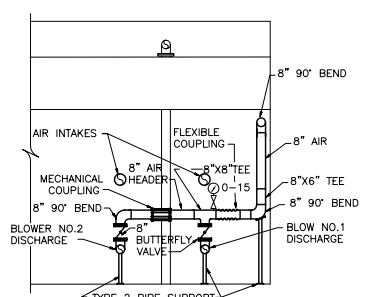
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PROCESS

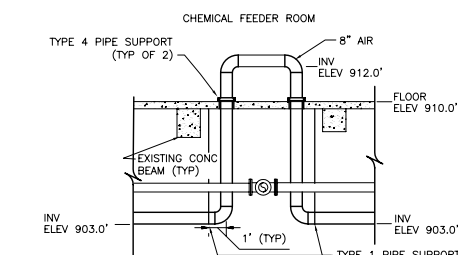
FILTER HOPPER AND  
TROUGH REPAIR  
PLANS AND DETAILS

P3



NOTE:  
1. ADJUST INV ELEVATION AS REQUIRED TO ELIMINATE  
INTERFERENCE WITH EXISTING PIPING, CONDUIT, AND  
OTHER EQUIPMENT.

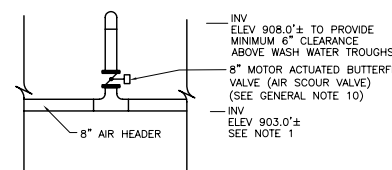
SECTION \_\_\_\_\_ P4.2  
NO SCALE P4



NOTE:  
1. LOCATE WATER SEAL LOOP WITHIN CHEMICAL FEEDER ROOM AS REQUIRED TO AVOID EQUIPMENT, PIPING, STRUCTURAL MEMBERS, AND ALL OTHER OBSTRUCTIONS.

SECTION  
WATER SEAL LOOP

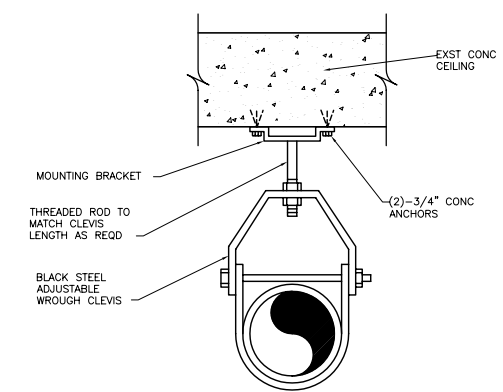
SCALE :  $1/4" = 1'-0"$  P4



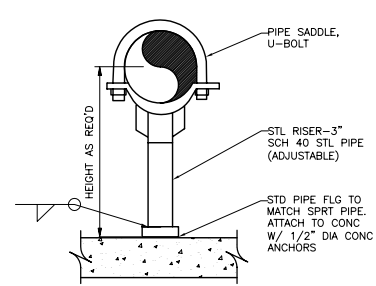
NOTE:  
1. ADJUST INV ELEVATION FOR 8" AIR HEADER PIPING AS REQUIRED TO AVOID EXSTING EQUIPMENT, PIPING, CONDUIT, AND ALL OTHER OBSTRUCTIONS.

SECTION \_\_\_\_\_ P4.4  
NO SCALE P4

100

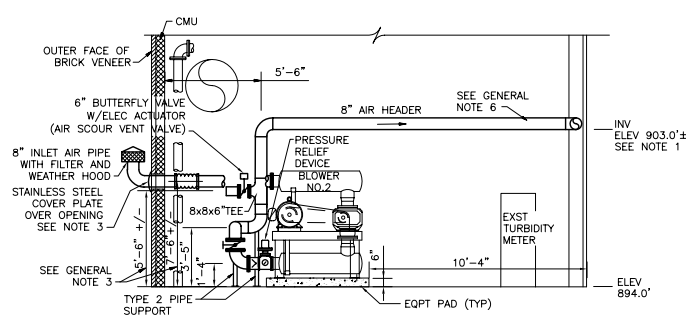


**PIPE SUPPORT—TYPE 1**  
NO SCALE



PIPE SUPPORT-TYPE 2

1. COORDINATE LOCATION OF 45° BENDS TO PROVIDE CLEARANCE BETWEEN AIR HEADER AND EXIST 6" DS IN CORNER OF ROOM.
2. AIR SCOUR GRID SYSTEM DISTRIBUTION PIPING WITHIN THE FILTER SHALL BE LAID OUT ACCORDING TO AIR SCOUR GRID SYSTEM MANUFACTURER'S SPECIFICATIONS. ALL STRUCTURAL SUPPORTS AND INSTALLATION PROCEDURES SHALL BE ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. SEE CROSS-SECTION THROUGH FILTER MEDIA ON SH P2 FOR VERTICAL LOCATION OF AIR SCOUR GRID SYSTEM.
3. DIMENSIONS FOR AIR SCOUR BLOWERS MAY VARY WITH MANUFACTURER SELECTED BY CONTRACTOR TO FURNISH BLOWER(S).
4. ENLARGE EXISTING 3-1/2" SURFACE WASH WATER PIPING WALL PENETRATION TO ACCOMMODATE 8" AIR HEADER PIPING.
5. RELOCATE ALL EXIST PIPING AS REQD. TO INSTALL AIR HEADER PIPING.
6. PROVIDE PIPE SUPPORTS AS REQD. TO SUPPORT AIR HEADER PIPING. MAX SPACING 8' ALONG STRAIGHT PIPE. PROVIDE TYPE 1 PIPE SUPPORTS FOR AIR HEADER PIPING IN FILTER GALLERY. PROVIDE TYPE 3 PIPE SUPPORTS FOR AIR HEADER PIPING IN WORK SHOP AND TYPE 2 PIPE SUPPORTS WHERE INDICATED. PROVIDE SUPPORT WITHIN 1' OF ALL BENDS.
7. BID ADDITIVE 1 INCLUDES BLOWER NO.1, ALL 8" AIR HEADER PIPING FROM BLOWER NO.1 TO THE FILTERS, 8" ACTUATED BUTTERFLY VALVES, AIR SCOUR GRID SYSTEM DISTRIBUTION PIPING AND ALL ACCESSORIES. BLOWER NO.2 IS BID ADDITIVE 2.
8. IF BID ADDITIVE 2 IS NOT AWARDED, INSTALL BLIND FLANGE ON UNUSED END OF 8" TEE.
9. PROVIDE MECHANICAL COUPLING IF REQD FOR INSTALLATION OF 8" HEADER.
10. IF BID ADDITIVE NO.1 IS NOT AWARDED, EXISTING SURFACE WASH VALVES SHALL REMAIN.

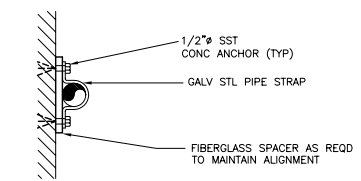


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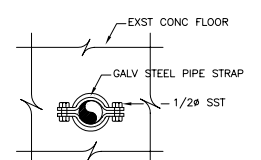
1. ADJUST INV ELEVATION OF 8" AIR HEADER AS REQUIRED TO ELIMINATE INTERFERENCE WITH EXISTING PIPING, CONDUIT, AND OTHER EQUIPMENT.
2. PROVIDE CHECK VALVE AND BUTTERFLY VALVE W/HAND WHEEL OPERATOR FOR EACH BLOWER.
3. CORE DRILL THRU BRICK AND CMU, INSTALL 8" AIR PIPE. GROUT IN PLACE AND INSTALL COVER PLATE OVER OPENING.

**SECTION** P4.1  
P4  
NO SCALE

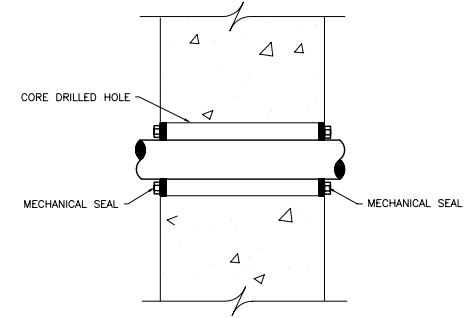
**PLAN - AIR SCOUR SYSTEM**  
SCALE: 1/4"=1'-0"



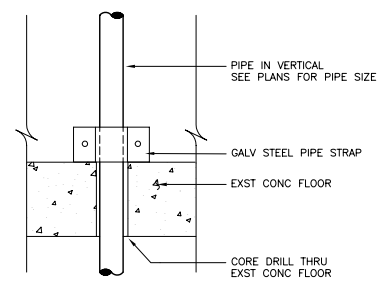
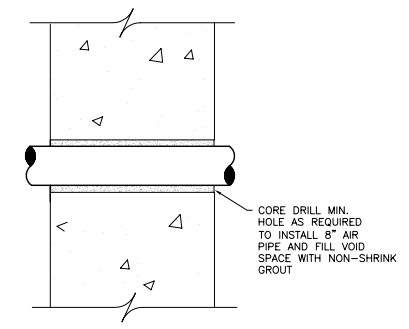
SECTION



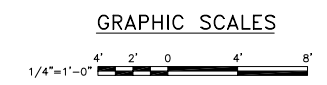
## PLAN

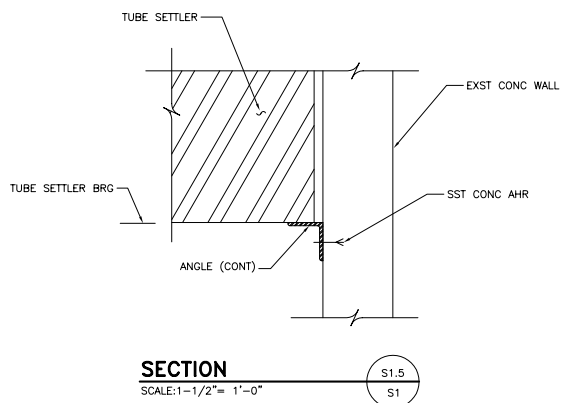
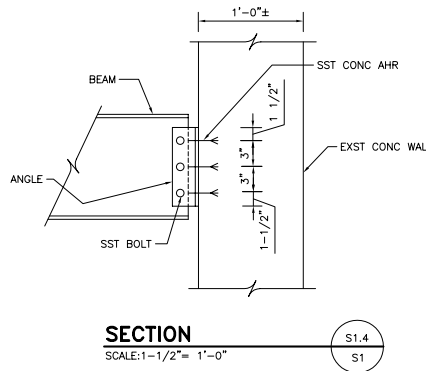
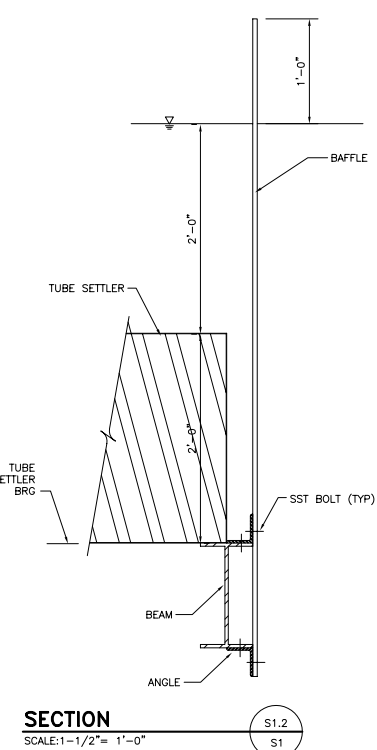
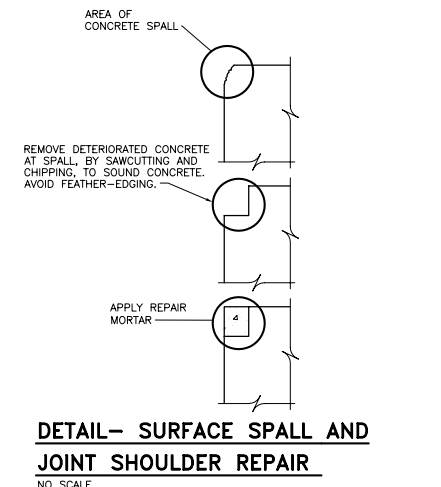
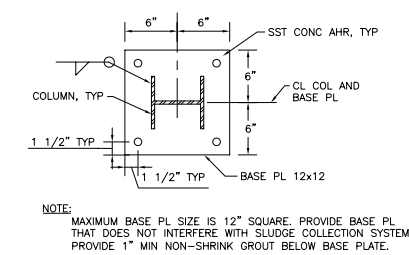
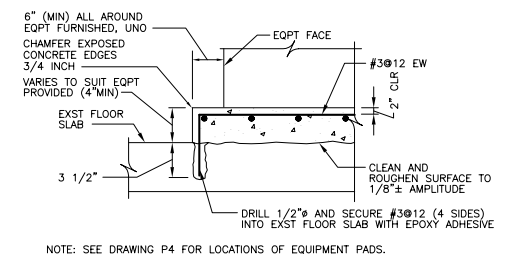
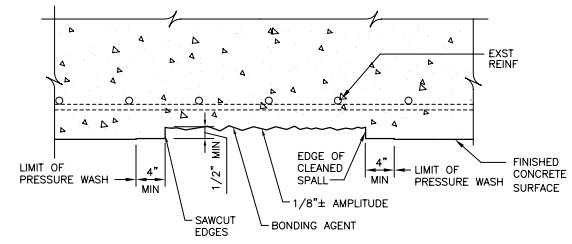
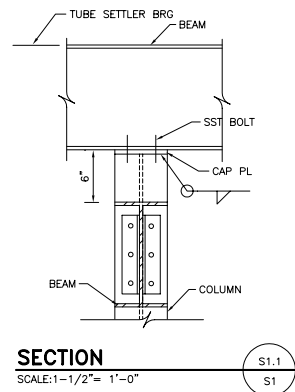
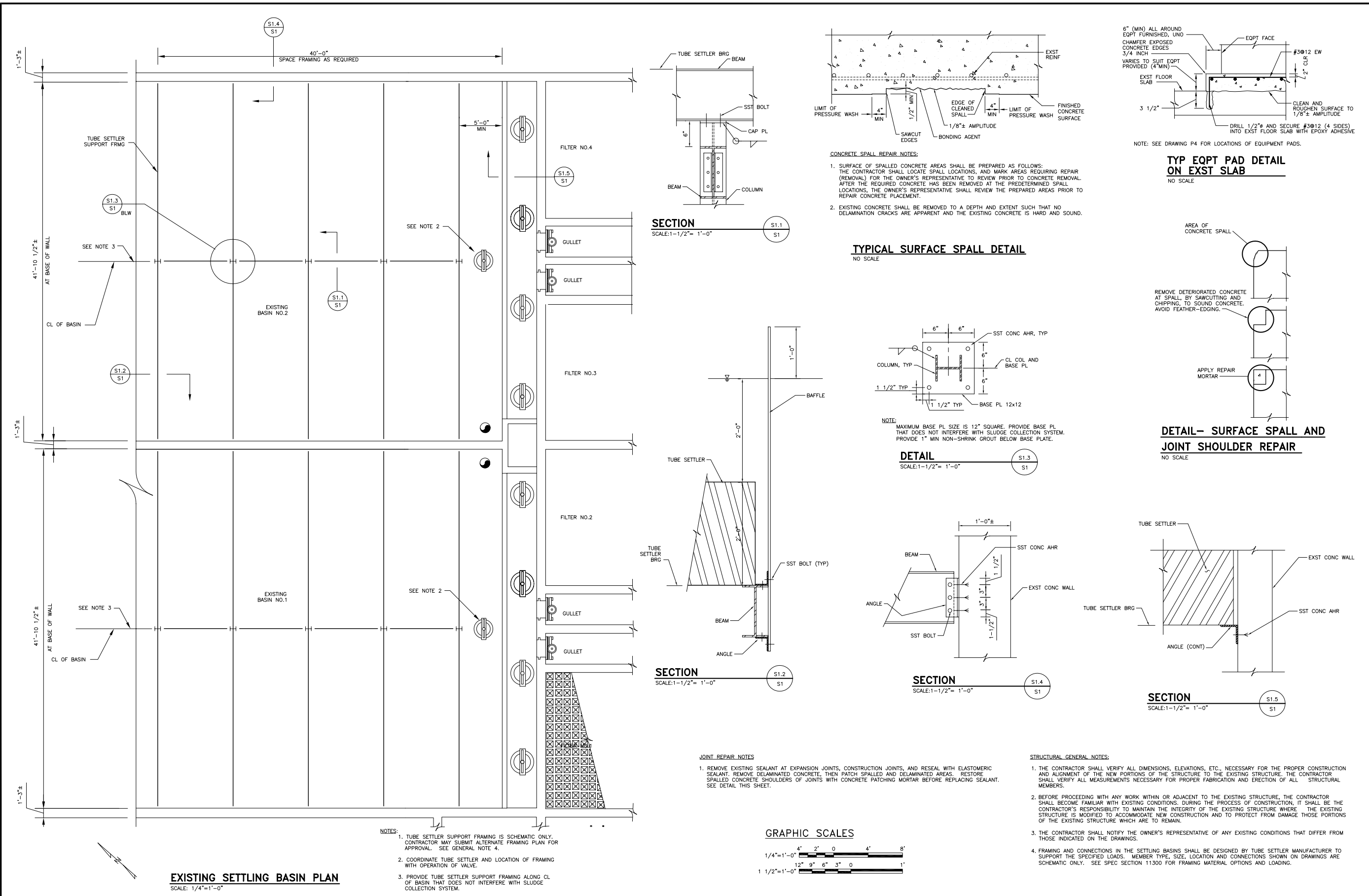


**PIPE PENETRATION**  
**THROUGH FILTER WALL DETAIL**  
NO SCALE

ELEVATION

**PIPE PENETRATION**  
**THROUGH WALL DETAIL**  
NO SCALE



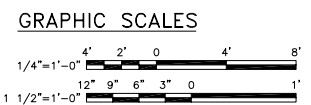


**JOINT REPAIR NOTES:**

1. REMOVE EXISTING SEALANT AT EXPANSION JOINTS, CONSTRUCTION JOINTS, AND RESEAL WITH ELASTOMERIC SEALANT. REMOVE DELAMINATED CONCRETE, THEN PATCH SPALLED AND DELAMINATED AREAS. RESTORE SPALLED CONCRETE SHOULDERS OF JOINTS WITH CONCRETE PATCHING MORTAR BEFORE REPLACING SEALANT. SEE DETAIL THIS SHEET.

**STRUCTURAL GENERAL NOTES:**

1. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, ETC., NECESSARY FOR THE PROPER CONSTRUCTION AND ALIGNMENT OF THE NEW PORTIONS OF THE STRUCTURE TO THE EXISTING STRUCTURE. THE CONTRACTOR SHALL VERIFY ALL MEASUREMENTS NECESSARY FOR PROPER FABRICATION AND ERECTION OF ALL STRUCTURAL MEMBERS.
2. BEFORE PROCEEDING WITH ANY WORK WITHIN OR ADJACENT TO THE EXISTING STRUCTURE, THE CONTRACTOR SHALL BECOME FAMILIAR WITH EXISTING CONDITIONS. DURING THE PROCESS OF CONSTRUCTION, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE INTEGRITY OF THE EXISTING STRUCTURE WHERE THE EXISTING STRUCTURE IS MODIFIED TO ACCOMMODATE NEW CONSTRUCTION AND TO PROTECT FROM DAMAGE THOSE PORTIONS OF THE EXISTING STRUCTURE WHICH ARE TO REMAIN.
3. THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE OF ANY EXISTING CONDITIONS THAT DIFFER FROM THOSE INDICATED ON THE DRAWINGS.
4. FRAMING AND CONNECTIONS IN THE SETTLING BASINS SHALL BE DESIGNED BY TUBE SETTLER MANUFACTURER TO SUPPORT THE SPECIFIED LOADS. MEMBER TYPE, SIZE, LOCATION AND CONNECTIONS SHOWN ON DRAWINGS ARE SCHEMATIC ONLY. SEE SPEC SECTION 11300 FOR FRAMING MATERIAL OPTIONS AND LOADING.



**NOTES:**

1. TUBE SETTLER SUPPORT FRAMING IS SCHEMATIC ONLY. CONTRACTOR MAY SUBMIT ALTERNATE FRAMING PLAN FOR APPROVAL. SEE GENERAL NOTE 4.
2. COORDINATE TUBE SETTLER AND LOCATION OF FRAMING WITH OPERATION OF VALVE.
3. PROVIDE TUBE SETTLER SUPPORT FRAMING ALONG CL OF BASIN THAT DOES NOT INTERFERE WITH SLUDGE COLLECTION SYSTEM.

**EXISTING SETTLING BASIN PLAN**  
SCALE: 1/4"=1'-0"

SEALS	CONSULTANT		ABERT FILTRATION PLANT FILTER REHABILITATION  CITY OF LYNCHBURG, VIRGINIA	<div>HSMMArchitectsEngineersPlanners HAYES, SEAY, MATTERN &amp; MATTERN, INC. 1315 FRANKLIN ROAD ROANOKE, VA 24016 (540) 857-3100WWW.HSMM.COM</div>	<table><tr><th>REV</th><th>DATE</th><th>DESCRIPTION</th><th>APP</th></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></table> <table><tr><td>COMM NO:</td><td>60308A</td></tr><tr><td>ISSUE DATE:</td><td>DEC. 19, 2003</td></tr><tr><td>DESIGNED BY:</td><td>DES</td></tr><tr><td>DRAWN BY:</td><td>REM</td></tr><tr><td>CHECKED BY:</td><td>PHM</td></tr><tr><td>SUBMITTED BY:</td><td>RFC</td></tr></table> <p>© HAYES, SEAY, MATTERN &amp; MATTERN, INC., 2003. ALL RIGHTS RESERVED.</p>	REV	DATE	DESCRIPTION	APP																																					COMM NO:	60308A	ISSUE DATE:	DEC. 19, 2003	DESIGNED BY:	DES	DRAWN BY:	REM	CHECKED BY:	PHM	SUBMITTED BY:	RFC	STRUCTURAL  SEDIMENTATION BASINS MODIFICATIONS, NOTES AND DETAILS	S1
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